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(Vol.1.)

REMARKS
ON
HYDROPHOBIA,
&c.

REMAINDER
OF
HYPOPHOSPHITE
CO.

REMARKS
ON
HYDROPHOBIA;
OR THE
DISEASE

PRODUCED BY THE
BITE of a MAD DOG,
OR OTHER
RABID ANIMAL.

By ROBERT HAMILTON, M. D.

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON;
OF THE ROYAL MEDICAL AND PHYSICAL SOCIETIES, EDINBURGH;
OF THE MEDICAL SOCIETY, LONDON;
AND LATE PHYSICIAN TO THE ARMY.

IN TWO VOLUMES.

THE SECOND EDITION, WITH ADDITIONS AND CORRECTIONS.

Morsu virus habent, et fatum dente minantur. LUCAN. PHARSAL.
Aliorum factis, nobis quod ex usu sit admonemur. CRATO.

VOL. I.

SOLD BY LONGMAN, PATERNOSTER ROW, LONDON.

1798.

STIMULANTS

HYDROPHOBIA

OF THE

DISEASE

BY

WILLIAM DOUGLAS

OF

GLASGOW

BY ROBERT MATHISON, M.D.

PHYSICIAN TO THE ROYAL INFIRMARY, GLASGOW
AND ASSISTANT SURGEON TO THE ROYAL HOSPITAL, DUNDEE

IN TWO VOLUMES

THE FIRST VOLUME, CONTAINING THE HISTORY AND SYMPTOMS

OF THE DISEASE, AND THE SECOND VOLUME, CONTAINING
THE TREATMENT, AND THE RESULTS OF THE TREATMENT

VOL. I.

LONDON: PUBLISHED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD, 1825.



TO THE

Rev. JAMES CALDWELL,

In the County of Down, Ireland.

DEAR SIR,

I Know not to whom we are more obliged, than to those who have had the care of our earlier instruction. To conscientious and diligent preceptors mankind are more indebted for future happiness, and often for future fame, than to splendid titles, or to great wealth; yet the rank or the emoluments far from compensate the toil and utility of the teacher.

Under your tuition I spent some happy years, looking forward with youthful hope and sanguine expectation to pupil emancipation, and to manhood, when the smiles of fortune, as warm

imagination had figured, should succeed school-boy cares ; and easy competency, if not wealth, follow a life of active and useful industry. Gaudy illusion ! puerile anticipation !

When this period arrived the title of friend succeeded to that of preceptor. In the former capacity you were no less instructive to your younger associate than in the latter. The familiarity of the friend served to heighten the moral precept, and the social hour of rational gaitly sweetened instruction. Distance of time has only mellowed, not obliterated the picture from my mind. Your pupil, therefore, grateful for instruction, grateful for friendship, offers you this humble tribute, and as a small return thus publicly makes his acknowledgements.

The observations which follow in these pages can afford you but little entertainment ; the sacred duties of religion lead you from such studies. In dedicating them to you however, I discharge a task, a willing obligation, for which I have long made myself debtor. May you be
happy,

happy, and may eternal felicity crown your virtuous ministry and Christian hopes !

I remain,

Dear Sir,

With great friendship, respect, and esteem,

Your most obedient,

And very humble servant,

R. HAMILTON.

IPSWICH, March, 1798.



TO THE READER.



THE short time which I enjoyed the rank of Physician to the Army scarcely warrants me to notice it in my title page, two months being its limits. A calamity into which I fell about the time of my appointment,* was the means of depriving me of this rank. After a severe and tedious fever I totally lost my sight, and was on that account superceded. It has not hitherto been thought expedient to compensate me for this misfortune, by any other appointment either civil or military.

A few years of my life were formerly spent in the army, in a medical capacity, where the
duties

* In the summer of 1795.

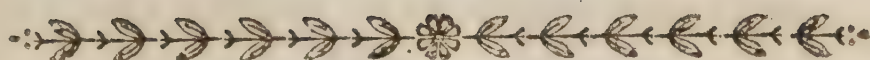
duties of my humbler station were *scrupulously* and conscientiously discharged;* but the situation did not, on leaving the army, entitle me to half pay, and custom, it seems, does not sanction such a recompence for that of physician, where the services have been so limited, whatever the circumstances of the case may be. In the retirement therefore from business which followed, I turned my attention to the revival of a treatise formerly composed on Hydrophobia.† The reasons first leading to that treatise may be seen in the Preface. This revival indeed has been followed by so considerable a number of additions and corrections, that it deserves more the title of a new treatise, than a second edition of the old; but whether a better elucidation of this abstruse disease (the point in view) be attained, the reader must determine.

Errors

* The result of my observations during this period are already before the public. Vide Duties of a Regimental Surgeon, &c.

† A translation of the first edition into German, with notes, was published at Leipzig, by Dr. Michaelis, 1787.

Errors from the nature of the subject are unavoidable ; and for errors, which cannot be few, arising from the want of that stricter examination which sight would afford, I must entreat the benevolent indulgence of the sympathizing reader.



P R E F A C E

TO THE FIRST EDITION.



IN consequence of an accident from the bite of a mad dog having lately happened, whereby a young gentleman of a respectable family in the county of Suffolk lost his life,* a few observations on the means of preventing Hydrophobia were then inserted in the Ipswich Journal, for the perusal of the neighbourhood, to enable them, in some measure, to oppose the fatal effects of the bite of a rabid animal, should the like happen among them in future.

Though

* Son of Admiral Sir Joshua Rowley.

Though drawn up in haste, and published incorrectly, yet they were read, and, in general, met with approbation; but as the limits of a newspaper confined them to a very narrow compass, and forbade a more minute discussion, the author, who was soon discovered, was solicited to enter more fully into the subject, and lay them before the public in form of a pamphlet.

With this he complied, yet not without hesitation, when he considered how many eminent men had trod the same path before him, whom, instead of expecting to surpass, he knew he must be contented to follow at an humble distance.

Though the partiality of friends flattered him that his remarks would be acceptable, yet the task was not undertaken from a presumption of being able to convey more information to medical men than what authors had already done, but solely with a desire to be useful, as far as he was able, to that part of the community with which he was now more immediately connected;
and

and among whom the recent misfortune had spread considerable alarm.

Beyond the limits of a pamphlet at first, and a short one, it was not his intention to lengthen these pages; but in pursuing his plan it was found impossible to furnish even a well-digested outline, much less discuss the subject with any degree of perspicuity within so narrow a compass; hence they were extended.

He has ventured throughout to deliver his sentiments freely, though with deference, and as freely canvassed those of men greatly his superiors in abilities and consequence, in the scale of science. For this he hopes, however, the public will acquit him, by allowing a right to offer his opinion, provided it be done with becoming modesty. Here indeed *they* must be the judges; and he trusts that he shall not be found, in the following pages, to have transgressed in this respect.

He has collected observations from the works of authors both ancient and modern, and endeavoured,

deavoured, as far as he was able, to distinguish between what could be supported on the grounds of rational induction, and what had only (as appeared to him) superstition and credulity to lean on.

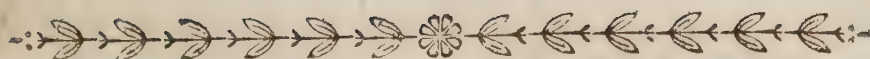
This essay* is not offered to the public as perfect; far from it. The author is too conscious of its imperfections. Yet he hopes it will be found to contain at least an outline of what is known on the subject. Hints, perhaps, may be gathered from it, as materials for others to work with, who may hereafter turn their attention to its farther investigation. With this view he submits himself to the public tribunal, not doubting but he shall meet with clemency; and that it will at least correct with lenity, where the candour of criticism cannot bestow approbation.

He would here also beg leave to offer his thanks to those gentlemen who favoured him with communications, and for the public use several of them so readily allowed him to make
of

* The same may be said of the present edition.

of their remarks. Among others, he holds himself particularly obliged to the ingenious and indefatigable Mr. John Hunter,* who not only honoured the author with frequent correspondence, but with a liberality of mind, allowed a public use of the information conveyed, with the sanction of his name to corroborate it; a name which every cultivator of medical science must long hold in esteem. To Sir Thomas Gooch, Bart. he likewise returns thanks for the honour he conferred by his letters, and the satisfaction his answers afforded to some enquiries made on the subject.

* Since this was written the public has to lament the death of this great physiologist.



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ERRATA.

Page.

- 3 line 13, for 10th read 14th.
5 — 12, for *melancholy* read a melancholy.
6 — note, for *shew* read show.
17 — 5, for *æfophagus* read *æfophagus*, *passim*.
——— 2 from bottom, for 80 read 80°
18 — 6, for *was* read were.
19 — 13, for *which* read who.
20 — 1, after house read (,)
——— 3, for *laid* read lay.
——— 18, for *they observed* read observed by the family.
——— 21, for *its* read her.
21 — 1, for *it* read the bitch.
——— 19, dele *however*.
——— 23, for *its* read her.
22 — 7, for *was* read were.
24 — 2, for *or* read nor.
33 — 3, for *in* read into.
——— 4, for *carried* read carry it.
40 — 16, for *has* read have.
43 — 17, for (.) read (,) and add, absorb lymph from cavities, and matter applied to the external surface.
47 — 1, for *substraction* read subtraction.
48 — 11, for *in* read on a.
53 — note, last line, after and read hence.
60 — 5, for *faster than* read as soon as.
62 — 4, for *laureo-ceratus* read lauro-ceratus, *passim*.
64 — 10, for *innoculation* read inoculation, *passim*.
——— 3 from bottom, for *exilla* read axilla.
89 — 1, after almost add the.
91 — 1, after and add the.
100 — 11, for *its* read their.
102 — 9, for *fell* read fallen.
104 — 3, for *ocular* read ocular.
——— for *negroe* read negro, *passim*.
107 — 4, for *consistent* read consistently.
——— 6 from bottom, after have read had.
129 — 11, for *have* read has.
132 — 7, for *where* read were.
133 — 4, note, for *positiveness* read confidence.
134 — 8 from bottom, dele be.

Page.

- 136 — 5 from bottom, for *which* read whom.
 142 — 2, note, after country read (;) after time dele (;)
 145 — 6, for *where* read were.
 154 — 5 and 6 from bottom, for *tore* read torn.
 160 — 12, for *speecial* read special.
 167 — 7 from bottom, after grant read that.
 175 — for *preventative* read preventive, *passim*.
 177 — 5, for *nor* read or.
 178 — 11, after find dele that.
 179 — 11, for *prevented* read preserved.
 185 — for *Haulston* read Houlston.
 189 — 2, for *physiologists* read pathologists.
 195 — 3, after supposed add to be.
 199 — 4, for *principle* read principal.
 202 — 12, for *Illiad* read Iliad.
 204 — 11, for *with sometimes* read sometimes with.
 212 — 4 from bottom, after from add producing.
 215 — 13, for *vomitted* read vomited.
 217 — 9, for *reaching* read retching.
 218 — 9, for *it* read the vomiting.
 223 — 6, for *which* read whom.
 ——— 12, for *which* read who.
 ——— 16, for *which* read whom.
 224 — 8, for *which* read who.
 ——— 14, for *which* read who.
 227 — 2, for *perishing* read who perished.
 237 — 12, after this add to be.
 ——— 5 from bottom, for *of distinction of* read of a distinction between.
 245 — 4, dele *however*.
 ——— 8, dele *however*.
 250 — 13, for *which* read whom.
 254 — 4 from bottom, for *commencement* read commencing.
 258 — 13, for *leifon* read lesion.
 ——— 17, for *leifons* read lesions.
 259 — 5, for *leifons* read lesions.
 269 — 6, dele *however*.
 ——— 15, for *geral* read general.
 278 — 7, dele *however*.
 ——— 4 from bottom, dele *however*.

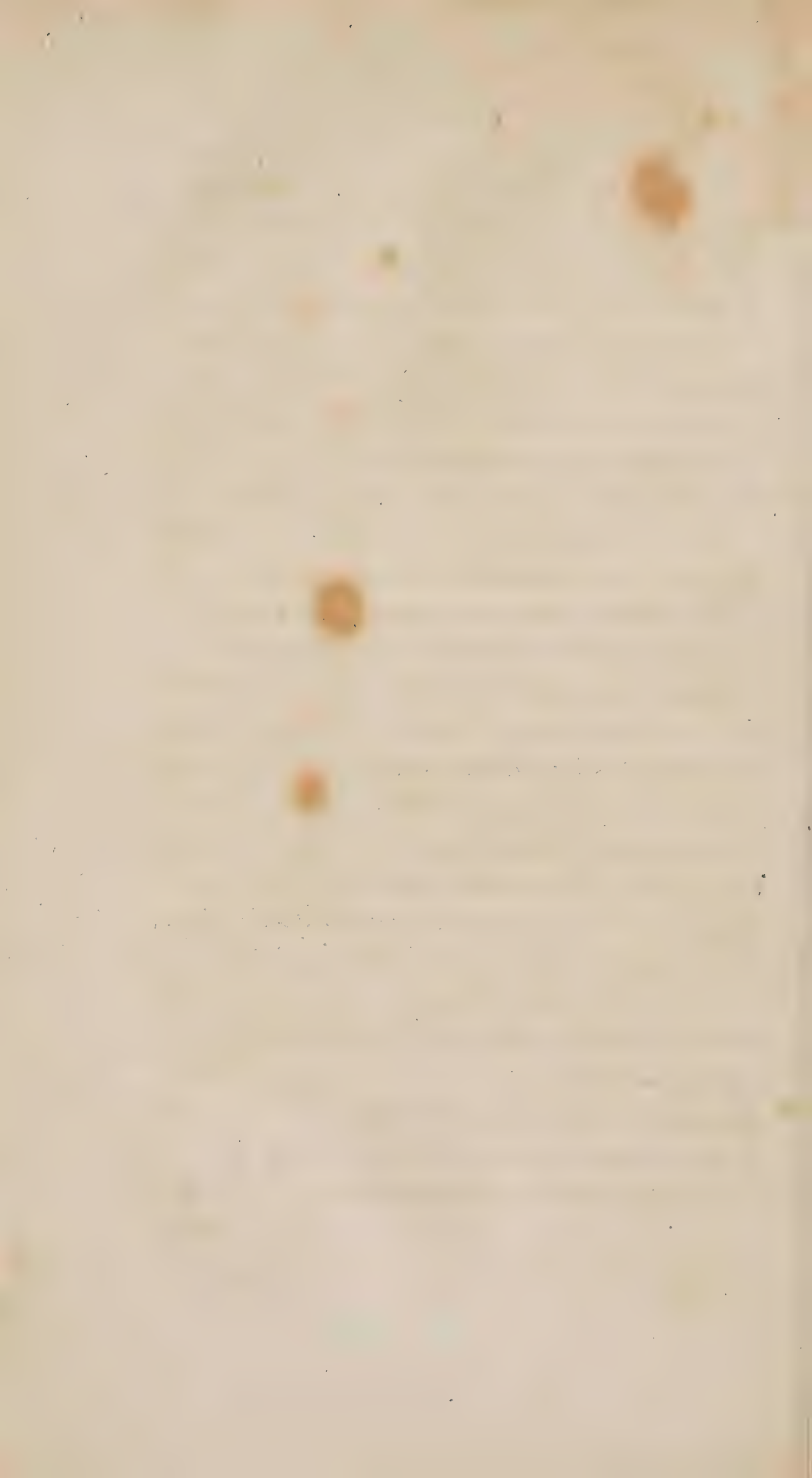
☞ The reader is requested to correct misplaced commas when they occur.

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R E M A R K S
O N
H Y D R O P H O B I A,
& c.

MANY authors of respectable abilities have attempted to investigate the nature of the disease occasioned by the poison from the bite of a rabid animal. Much has been written, many theories hazarded, and as many remedies proposed to combat it for upwards of two thousand years^a, since the malady was first described. Yet it still remains in a great measure the reproach of the medical profession.

Of late it seems to be more prevalent than heretofore. This is a lamentable reflection when

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^a Since the days of Aristotle, for not long before his time the disease according to some had its origin. This opinion admits of much doubt, but of this afterwards.

we confider that the difeafe has in no inftance, after Hydrophobia is fully eftablifhed, admitted of a cure. Its frequency may be attributed to two caufes; the one, indeed, is the confequence of the other: firft, the fondnefs we exprefs for the dog, which brings him fo often into our company; and fecondly, the great multiplication of the animal. His utility in focial life, and the gratitude we bear him, for his attachment, in forfaking his own tribe to follow our deftiny, will in fome meafure explain this.

Thoufands, as is too well known, are bred more for amufement than for advantage to their owners. A good houfe-dog in former days was the only fpecies to be found in a farmer's yard; or a common cur at a cottage door. Thefe were kept for the protection of the family: nor does it appear that the breed was either greatly multiplied or fed, in this country at leaft, for mere pafstime. It is different at prefent; every labourer and mechanic has not only his dog, but perhaps two or three. The opulent farmer and the man of landed property, feveral brace. It is not uncommon to fee even a dozen or more of fporting dogs in a farm houfe.

Were

Were I to offer a conjecture on the causes of this, I should attribute it in part, to our game laws. The game abounds from the constant care taken for its preservation. Every inhabitant is a *sportsman* in some measure, where it is thus in plenty, and he who cannot lawfully kill it, never fails to steal; or in other words is a poacher. Although there be a law to restrain unqualified persons from carrying guns, yet there is none I believe against keeping a dog^b. With this and his net the poacher's purpose is answered.

From the 10th of September during the ensuing six months annually, the sports of the field, i. e. pursuing game with packs of dogs, or with pointers, greyhounds, or other species of this animal, occupy the greater number of the male part of the community, high and low, in this country.

Against the amusement in general, however, I make no other reflection than as far as it concerns my subject; the legislature, not an individual, is the proper power, if it be found a nuisance, to interfere. Let the multiplication of this animal proceed from what source

^b Since writing the above, I find this also is unlawful.

it may, one thing appears evident, that the disease I am about to consider has been more frequent than common for the last fifteen years, and the subject on that account the more interesting.

Though the cat equally communicates this malady with the dog, our attachment to this creature is by no means equal. We multiply it therefore no farther than its domestic utility requires, and in proportion we find fewer of this species under this disease. This is one reason; but whatever other reasons we may adduce to explain the infrequency of feline madness shall be reserved for a future part of these pages^c.

Our lives and property, from the propagation of this disease, are both at issue; the malady is not more fatal to ourselves, than it is to our domestic animals, in which lie so much of the comforts and conveniencies of life; horses, cows, hogs, and other live stock, forming a great proportion of the wealth of this nation, often suffer thereby.

An infected dog may wound many hundreds of these animals before he can be killed, or before the disease of itself terminates his life.

^c Vide Remote Cause.

life. He may traverse counties, leaving dismal marks of his destruction in every parish, not only among flocks and herds of cattle, but among his own species, multiplying the malady in proportion to the numbers he bites: from whence again the infection is propagated to a dreadful length, like the ravages of a pestilential fever, before its progress can be checked and all that had been bitten destroyed. It is but a few years since this observation received in this neighbourhood melancholy confirmation. Several of the human species (nine it is affirmed) and much property in live stock were destroyed by one dog alone, committing devastation for three days together before he could be killed in the adjoining county^d.

The greater frequency of the disease has of late been observed in America^e, as well as in Great Britain. If it is not to be attributed to the multiplication of the dog in both countries more than formerly, it may be difficult to explain to what it should be placed; for climate I think is by no means the chief, though a considerable agent in its excitement. Though it is an infectious disease, and appears to me

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therefore

^d Essex in 1792.

^e Vide American Transactions, Vol. 3.

therefore seldom induced but by infection from a rabid animal^f, yet, perhaps, it is not impossible, that it may arise from internal causes and without communication.

It is affirmed, that in Jamaica the disease has not appeared among dogs for near fifty years past; and that in the Island of Antigua it is altogether unknown. If it was induced by a warm climate alone, in what part of the world are we to look for greater heat? We are likewise assured that the animal abounds in Jamaica, even more than in Great Britain. The Negro prides himself as much in his dog as any sportsman does in England; and is allowed to indulge himself in this respect^g. It may be asked, where have we a stronger proof of its not arising spontaneously in the animal, than from this circumstance? Yet such a conclusion must not be hastily drawn. In what manner its first appearance took place, seems equally as obscure as the first origin of other infectious specific diseases. How did the small-pox first arise? The answer is difficult.

^f Both climate and diet greatly influence animal life and health, as we shall shew hereafter.

^g Vide Transactions of a Society for the improvement of medical and chirurgical knowledge.

difficult.—Thus far we know, it was brought from Eastern countries—Climates warmer than where it now rages. But do we ever observe it arise without infection? Although it may be difficult to prove this, yet I would not positively deny it.

The derived small-pox, indeed, is most frequent, but from this merely I should deem it rash to deny, that there may not be situations in which the animal fluids can breed the complaint; or a combination of particles from internal causes be united, forming the infection, giving birth to the disease, without any communication with persons under it, and without the least contact with variolous matter proceeding from another subject. We may transfer the same reasoning to the disease under consideration, and challenge the validity of those arguments which would exclude spontaneous Hydrophobia, and confine it solely to inoculation from a rabid animal.

As the cat is useful to domestic œconomy, and as in every house one or more are kept, danger arises from them, since this creature is subject to the disease. Finding ourselves, therefore, daily exposed to mischief, from these second, and equally constant inmates,

and being apprized of the loss society may sustain from their madness, those, whose province it is, it is hoped, will be roused to more attention, whether they be legislators or physicians, and endeavour both separately and conjointly to arrest its progress, the one by judicious restraints on the multiplication of both dog and cat, the other by endeavours to investigate the nature of this abstruse malady, and bring the cure to greater certainty.

Some have contended that the virus chiefly belongs to the dog kind, viz. the dog so distinguished, the wolf, the fox, and the jackall. I am ignorant whether there be any instance of its propagation ascertained in this last, but since naturalists have discovered it to be of the dog class, I mention it. I add the cat, the domestic animal of this name, because we have proofs too numerous of its capability of communicating the disease. It is doubtful, perhaps, whether it should be extended to all the class of the feline tribe, but we have little to do with the lion, the tyger, and other wild animals of this genus. The illustrious Boerhave, indeed, extended it much farther; and was of opinion it might be received not from these only, but from “Equi, asini, muli, boves,

“boves, fues, fimii, galli, gallinacei, et
 “homines,”—to use his own words; and he
 adds, “Id vitium prius rabiosi in alios pro-
 “pagaverunt;” but to this I cannot give my
 assent. Some proofs to the contrary shall be
 adduced hereafter.

A story has been propagated, but on what
 foundation is not discovered, that, in the
 county of Suffex, a few years ago, a cow
 under the influence of Hydrophobia, in at-
 tempting to bite, dropt her saliva on a man,
 who was said to have contracted the disease in
 consequence, and died of it in the usual way:
 but suspecting this to be an idle tale, some
 pains have been taken to discover the truth of
 the rumour. The result was, that nothing
 of the kind had ever been heard of in the
 neighbourhood where it was said to have
 happened^h.

Since the first edition of these observations,
 though only about ten years, several persons
 in this countyⁱ have suffered from the malady;
 yet

^h Dr. White of Bury St. Edmund's, who communicated
 this report to me, and who also doubted its authenticity, wrote
 to the Dean of Chichester on the subject, whose answer was
 satisfactorily negative.

ⁱ Suffolk.

yet I am inclined to think several others escaped by attending to the directions inculcated in those pages. It is true, we have no absolute proof whether the poison would have taken effect, but by acting as if we were certain of the fact we insure safety; while we have the double advantage of removing both apprehension and danger.

The cows, oxen, &c. that were bitten in this neighbourhood became affected and died. Several persons suffered in their fortunes, and an alarm for their own safety excited much uneasiness throughout the country. This produced at that time public meetings among the people, to deliberate on the best measures to be pursued to prevent future mischief; the result of which was a petition to parliament. It was resolved to solicit the interference of government, in order to impose a tax on all who kept these animals. The proposal, however, at that time met with no encouragement from the legislature^k. The principle on which the discussion turned, was to lessen the
number

^k A tax has since been laid on dogs; but it appears to be more a tax of revenue than of policy, or a preventative of the frequency of hydrophobia. It seems too small to answer this end; few will destroy their dogs, or keep a less number on that account.

number of these animals, and doubtless this was the grand hinge.

Every man considers that he has a right to keep his dog, if he possesses the means of giving him food. The poor man would think himself greatly oppressed should he be deprived of the pleasure of his faithful companion by a compulsive law; and this right we acknowledge: but each party ought to relinquish something, as in other cases of social compact, for the security of the whole. This will be consonant to sound policy.

When the malady termed Hydrophobia has once appeared, a death attended with dreadful circumstances beyond other diseases awaits the sufferer, and *inevitably* awaits him. Prophylactick means, indeed, are in our power, even when a person has received a wound; and these it is undoubtedly our duty to prosecute. For though we have hitherto failed in curing, yet by timely care and perseverance, we may, I am persuaded, with tolerable certainty, obviate the malady.

The first question that naturally occurs here, is, what are the signs by which we can discover the first stage of madness in the canine tribe? This seems a necessary enquiry, since most persons are so ignorant of it as to rush
pre-

precipitately on their ruin, by attempting to fondle, or shew marks of rash and misplaced kindness to dogs not only in this, but almost in the last stage of their illness.

The dog forsakes his own tribe, and adheres with strict fidelity to his master. This gives us an opportunity for observation. Those who are accustomed to this animal can pronounce when he is disordered, from his manner, comparing it with his healthy condition, with as much certainty as when any of their family are indisposed.

In the early stage, however, the difference between this and other diseases is not so obvious, for it has several symptoms in common with them. We find the same, indeed, in many of those affections incident to the human body. In the first day, the fever that precedes the eruption of small-pox or measles is difficult to be ascertained, and distinguished from others, except from the presumption of one or other of these disorders being prevalent in the place. A little time longer, however, removes doubt; we then observe some symptoms peculiar to the respective disease with which the individual is affected. The same may be applied to madness in dogs.

SYMPTOMS

SYMPTOMS IN THE DOG.

NOTWITHSTANDING this uncertainty some symptoms shall be mentioned peculiar to and forming this malady.

I. A disinclination for his food. He does not, it is true, refuse it; but he takes it with an evident indifference and listlessness; this indeed is not peculiar.

II. He is melancholy. It is as easy to mark this symptom in the dog as in the human species. In health he is frolicksome and playful; but now he hangs his tail, and at the approach of his master or any other of the family, shews less of that joy with which he was wont to welcome them on their return home.

III. His eyes appear mixed and dull. This may be called the first stage; yet there is scarcely any thing pathognomonic here. It should be observed, that in this stage he will still obey the call of his master, and follow him, nay, he will even fawn on him when he approaches; but his memory is less accurate and he occasionally forgets him. His irregular peevishness at this time points out he is greatly indisposed. It becomes now highly proper

proper to regard our safety, and not to trust him if he snarls; nor ought we to attempt to caress him.

As the first stage of the disease is indistinct and marks nothing peculiar, we may be in danger from want of suspicion of the nature of the malady; but let the indisposition of a dog be ever so slight, prudence ought to direct us to treat it as of importance.

The second is more distinctly marked; for in a day or two he feeds with less avidity, though he does not refuse, as has been said, his victuals; authors have affirmed, but erroneously, that at this time he refuses drink. He now shuns other dogs, and is equally shunned by them¹. Observation, I think, does not confirm that the healthy shun the infected in other diseases, to which in common with other animals they are liable.

Now comes the last stage; he loses altogether his recollection, quits his master's house, runs forwards he knows not where, and without any particular design, rushes in his fury,
and

¹ The observation of this symptom is attributed to a lady who resided at the village of Medoc near Bourdeaux.

M. Roux confirms the observation, that mad dogs are shunned by other dogs.—Vide Histoire et Memoires de la Soc. Roy. de Medecine. Année, 1783.

and without barking, at every animal that comes in his way, but turns not aside to bite any, and in the space of two days after, or less, dies convulsed. If he is tied up he bites at his chain in this stage of the malady, and is furious when approached.

The symptom of a drooping tail is more remarkable in this than in the former stage; another is likewise evident, viz. a convexity of the back, formed by drawing his hinder towards his fore legs, an indication of great uneasiness in the bowels. This is likewise accompanied by an extreme dryness of the nose.

In all the different animals under Hydrophobia (the dog included) the disease attacks by exacerbation and interval.—I can instance this from good authority and ocular inspection^m.

One thing is remarkable; and in which among others he materially differs from man under the same disease; he never avoids water, having

^m Mr. Constable of East-Bergholt, a gentleman who kept hounds between twenty and thirty years, has observed this, and lately distinctly described it to me. An opportunity has offered of my making a similar observation, as may be seen hereafter.

having no fear of it; and as it would seem, feeling no inconvenience either from drinking or touching it. I know from experience, he laps whatever liquid food is set before him, long after the poison can be communicated by his bite. Previous to his death some swellings about his throat *are said* to have been observed, and even the tongue has been affected in the same manner, and dripping with flaver: sometimes it has been seen to loll out of his mouth. Such is the common progress of the sufferings of a rabid dog, and such are the chief symptoms that distinguish it.

There is indeed a species of disease classed under this head, called by some the dumb madness. It is certain that dogs have been affected with a complaint under which they remain stupid, neither with inclination to bite, nor marked with exacerbations. Doubts may be entertained however of its being a different species of this complaint. I should rather refer it to a febrile affection simply, till its power of communicating rabies be proved. In some cases of Dissection, afterwards to be mentioned, we find little or no affection of the tongue and lips.

The

during this time there was scarcely any rain. Whether this had any influence in producing rabies among dogs shall not in this place be discussed; but so it came to pass, that about this time the town and neighbourhood of Ipswich was much infested with, and alarmed by these animals under this distemper.

The first we heard of them was in July in the camp at Landguard-Fort, distant about fourteen miles, where one appeared, and bit several dogs, which was the occasion of many being shot. For the same reason many were destroyed in this town. A little spaniel bitch accustomed to the parlour, and the plaything of the children in a family of this place, had contracted the disease; but how, or when, or whether it was bitten could not be traced; hence unsuspected it bit a kitten, one of the children four years and two months old, and a pointer puppy in succession, before it was known the animal was infected.

The kitten was bitten on the Saturday morning at seven, and so severely that it was judged proper to destroy it. The young lady was bitten very slightly on the edge of the upper lip and near the lower corner of the ala of the right nostril, about five in the afternoon
of

of the same day, August 29. In the interim the bitch shewed no symptoms whatever of irritability of temper, allowing a person to open her mouth, into which he introduced his hand for a proof to the alarmed family, that a dog who would suffer this familiarity, could not, as he affirmed, be mad. It was the next day, Sunday, about nine in the morning, when she bit very severely the pointer puppy on the upper lip, so as to cut it through. Between ten and eleven on the Tuesday following, the spaniel bitch died on the chain, and seemingly without a struggle. The puppy which had been bitten, and was near a year old, was, on this, immediately chained, and continued so till about ten o'clock, September 22, when he expired under rabies.

It should have been mentioned in its proper place that the bitch was remarked to be indisposed on the Friday, the day before the kitten and child were bitten. This observation was made by the servant, whom she followed that forenoon. He took notice of her occasionally running in a zig-zag direction, and grunting in an unusual manner, but without any marks whatever of ferocity.

The same day, Saturday, that the kitten was bitten, the bitch followed her mistress up the

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street

street to a house where she went to pay a visit, calm and composed. During her mistress's stay in the family she laid down and slept by her side, but was observed to be more convulsed, (in a dream as supposed) than common. On returning home she ran in the same manner, as the servant had observed, zig-zag down the street again grunting. Still no suspicion was entertained of madness; and these circumstances were only recollected afterwards.

It is evident from the above history, that the madness of this animal returns after certain intervals, resembling what we observe in the human species, and that it is during the fits only that it rushes on and tears whatever opposes it. We have seen that a fit came on early on the Saturday morning, which was the first they observed, and that the kitten being in its way was the immediate object of its fury, which in this instance was very great. From this till five in the afternoon, its intervals seemed to be tolerably compleat, unless as far as the zig-zag movement and grunting along the pavement, and the convulsive dream indicated indisposition.

At this period a slight return appears to have taken place. For the small and trifling wound now given the child during her walking in
the

the garden, (as it followed) is an evidence. It did not tear her as it did the kitten in the morning, but left her the moment it gave the snap, on the child's crying. Its fury did not continue, being gentle immediately after, suffering them to fondle it as usual.

Though the attention of the family was now naturally directed to the child, they were not prevented from observing this; and though a considerable alarm was created, yet it was removed in some degree by this consideration; and by supposing that the child might have laid hold of the bitch, playing with her in her usual manner, (being a parlour favourite) might perhaps have pinched her ears, or trampled inadvertently on her tail. This was a natural reflection; and, after washing the child's wounds with some cold water, soothed them for the night. Next day, Sunday, however, we observed another fit return with still greater violence and fury. The whelp above mentioned, passing by at that time, being the nearest object, became its victim; she darted upon it, caught it by the upper lip, cut it through and through, keeping her hold till the pup was forcibly dragged from her, by a servant who ran to its assistance. She was now

tied up, and the fit subsiding, she became composed as before, and meat and drink, which she did not refuse, ^{ere} ~~was~~ ordered for her as usual. Nothing remarkable was observed from this time till the Tuesday morning following, when she died, unless some uneasiness and howling, during the night, which was attributed to her being chained.

There was little or no saliva observed to flow, compared to what authors have said, who have written on the subject; no frothing at the mouth. The lips, however, were considerably protruded and swelled; and more moisture hung about the corners of the mouth than is seen in health. Upon the whole, there was enough to justify the idea that all authors have given, of an increased secretion issuing from the mouth. She did not lose her recollection of the family, but wagged her tail and seemed to fawn on them as usual, when they approached, till the evening before her death. One of the maid servants went to her on the Monday afternoon, while on the chain; took her in her arms and fondled her, while she returned her caresses by every external mark, as in health.

We see here a perfect history of this disorder as it appeared in this individual animal;
and

and we see farther, that the period it takes to run its course, is nearly the same with that which has been ascertained in the human species, dating from the symptom Hydrophobia. The first appearance of the disease was on the Friday, and the scene terminated on Tuesday morning, comprising a period of between three and four days.

The puppy was tied up on the death of the other, and fed as usual. This was September 1. On Sunday, two days before, as we have seen, he was bitten: he continued in perfect health, bearing his chain with ease, eating, drinking, and passing his different excretions in a healthy manner, till Saturday the 19th, or the twenty first day from the bite. He was now observed to be sick and vomit his food, but did not abhor water. His eyes appeared inflamed, yet rather dull and heavy than furious. That night he became very uneasy on his chain; howled, making a melancholy and unusual noise, which greatly disturbed the family, and renewed their apprehensions for the safety of the child°. On

c 4 Sunday

° It is with great satisfaction I mention the young lady's escape from the malady. Whether this was owing to the insusceptibility

Sunday the 21st. he became furious at times; was observed to pass neither urine or stools this day, champed and tore into bits a roll of brimstone which had been thrown into his water, tossing them to a considerable distance around. Nor did he seem afraid of the whip when cracked before him, from which he used to fly with precipitation; neither did he know at this time, his master's voice, who spoke to him in his usual manner.

On Monday the 21st. the creature's fury was increased; he bit at his chain and by violence broke loose, rushed into the stable where two servants were with the horses, who alarmed at the sight, climbed up into the hay-loft, *they don't know how*, (to use their own words). The chain was luckily laid hold of by a hooked stick on the outside, through an aperture between the door post and wall, by which he was dragged to the door, which happened
then

susceptibility of her habit at the time; the fortunate washing with cold water, and wiping with a dry handkerchief the bleeding scratches, and washing the mouth in general immediately on receiving the bite; or to the extirpation of the wounded parts about twenty eight days after, is not material. This last step was highly prudent, and ought never to be omitted in similar cases.

then to be shut. The person who accomplished this, held him with all his strength so that he could not move his head till the servants descended, procured another collar, put it over his head and thus secured him. This operation consumed near three hours, and required caution and dexterity for the safety of those concerned in it, but it protected both the men and horses from their impending danger.

As the animal was observed neither to pass stools nor urine the preceding day, two small balls of mercury and tin were given as a purge, which its master had been in the habit of administering to his dogs occasionally, and which had the desired effect. He champed and readily swallowed them when thrown on a plate before him, but passing another restless night in the manner already described, howling and disturbing the family, he died next morning, (the 22d.) apparently without a struggle.

It deserves notice, that in this case also there was little or no increased quantity of saliva secreted, nor frothing at the mouth; but in the course of the last day the tongue was somewhat swelled, which seemed to be the chief cause of impeded deglutition that day, but there
appeared

appeared no horror whatever to the water, as he neither fled from, nor shunned the vessel which stood by and contained it.

We see in this second case, a period from the commencement to the termination of the disease almost exactly the same with that of the first: we perceive also a train of symptoms so similar in the two cases, that we may fairly draw a history of the disease in this animal from them. We can in this last case mark the exact period from the bite till death, a thing which hitherto has not been so accurately ascertained; but whether it be the same in every other case, we ought not rashly to conclude. Constitution may produce variety^p. In a third case which I have had an opportunity of seeing in this animal, the period was nearly the same; but to elucidate the

^p Hugo Meynell, Esq. places fourteen days as the shortest and eight months the longest interval, from his own observation*, between the communication of infection and the commencement of the disease in the dog. Whatever this gentleman says respecting dogs will have great weight, when the attention he has paid to the habits of this animal, and the consequent prevention of disease for many years, among his pack, are considered. I am aware of the rashness that may

* Vide Manchester Memoirs, vol. 4. part 2. page 468, note.

the history still further, I insert the following, where other things worth notice will be found.

This is from a case of Hydrophobia communicated by Mr. Alexander Johnston, Surgeon ^{at} ~~of~~ Dunbar^a. There is here the inspection of the stomach of a rabid dog, immediately after being killed. The animal seized a man named Thomas Hogg, without any previous notice by barking or otherwise, The calf of the leg was the part wounded; Hogg with great resolution laid hold of his jaws, and would not quit them till the dog was killed, which was done by a person at his entreaty, coming up at that instant; saying, with a noble humanity, as for himself he could not be worse, but that if he let him go, others might suffer. This happened on December the 13th, 1793. “ Having always understood ”

attach to any doubt concerning the accuracy of that part of his observation, which gives eight months from the reception of the infection, (I presume he speaks of the inoculated) to the commencement of the disease. I do not deny the possibility, but it does not accord with what has fallen within my own knowledge, nor with answers I have received from various sources to enquiries on this head. Might not this have happened from a second infection unobserved by Mr. M.?

^a Vide Medical Commentaries, dec. 2. vol. 10. 1795.

stood" says the author, "that a dog labouring under Hydrophobia would neither *eat* nor *drink*, the stomach was inspected and to our joy we found it more than half full of *food*^r, which had a corrupt and disagreeable smell; inasmuch that we conjectured the animal had been eating human faces." There was nothing particularly observable in the mouth and fauces.

We would only here desire the reader to notice the affection of this organ. He can have no hesitation in pronouncing it the chief seat of the disease, including perhaps part of the intestinal canal. Nothing is said of the condition of its coats; whatever they may have been, a septic~~ic~~ tendency was produced to a high degree, as was indicated by the smell. The difficulty of deglutition seems to proceed from the propagation of the affection from the cardia into the œsophagus. But it does not appear that the glands destined for the secretion of the saliva, were much if at all affected. It would seem, that as the constitution of the
dog

* The contrary was fully established in the first edition of this work published about ten years ago. It was proved by various instances that this animal *can* communicate the infection a considerable time before he ceases either to eat or drink.

dog varies, so are the symptoms modified. In this respect it resembles what takes place in the human species.

Upwards of a dozen dogs were bitten at the same time, they all died in consequence of the infection; but there was one of them who did not exhibit the same symptoms of rage as the rest, neither did his recollection forsake him, for a little before his death he expressed pleasure at the sight of his master, by shaking his tail. During the disease he never attempted to bite either animal or person that approached him^s.

In the dissections of some dogs who have died of the malady, the appearances on the inside of the stomach have been similar to those found in the human subject, as we shall see hereafter. This would seem to point out the specific nature of the poison; and that this organ is the part on which it principally
exerts

^s Vide. Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge.

Some have thought a dog under this dumb and placid madness, as it has been called, was incapable of communicating the disease; but two cases to the contrary are affirmed. Vide Medical Commentaries, vol. 10. dec. 1,

exerts itself, as the skin is in the small-pox, measles, scarlatina, and some other eruptive disorders.

Although the progress of the disease in the canine tribe may be called uniform, yet it is not without some variety; for it has been found that a dog will return after leaving his master's house, and after a fit of fury will again become quiet and peaceable towards the persons, (those of the family) at whom before he seemed enraged.

Since we find it invariable that the dog strays from home when the disorder is approaching its acme, it suggests a caution of the utmost importance; this is, never to be familiar with strange dogs, and on all occasions to approach them with great reserve. From a number of cases of this afflicting malady, in the human species, collected by a society, whose aim was information relative to this, it appears that the greater number were induced from a familiarity with strange dogs. In whatever degree our affection towards this animal may be expressed, for his attention to us in preference to his own species, yet our prudence for self preservation should not desert us.

It

It is a fortunate circumstance for man, that he is not so liable to be infected as the dog; not more than one, perhaps, in sixteen of the human species, who are bitten, take the disease^t. The susceptibility of the dog after a bite is discovered to be much greater. Four men and twelve dogs were bitten by the same rabid dog; all the men escaped, but every one of the dogs died mad. In comparing instances of this kind in authors, many proofs corroborating this remark, will be found. The men here used no other means of prevention than what we every day see fail^u. To what can we attribute this? Scarcely, I think, to the greater sensibility of the canine system, rendering it more easily infected. It must be to some other law in the œconomy of his frame.

From the above view of the malady, it will appear that very small attention might prevent any accident from his bite; for in the early stage of his illness, when he lowers only and seems

^t Some have calculated it at one in twenty-five. On collating however a number of instances of bites received, the average did not amount so high.

^u Vide Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge.

seems heavy, he shews little or no marks of a change in his temper. He neither snaps at, nor bites at persons near him; and hence, in dubious cases where prudence raises suspicion, he might easily, nay, he ought to be tied up till time should determine the event. Nor would this be found long; for perhaps less than ten days may bring the whole scene to a conclusion, or sufficiently convince us that our fears are groundless.

But let us suppose that this has been neglected, or that the rabid animal has unexpectedly come in the way, and unhappily exercised his fury, too successfully, either on one or more of the human species, or on some of our domestic animals, what then is to be done?

Before this question can be satisfactorily answered, it may be necessary to notice two opinions respecting the pathology of the disease, which of late have been considerably agitated. The one, whether the infection acts locally and by irritation, not only on nerves but tendons, and thereby sympathetically affecting the whole nervous system and moving fibres, without the introduction of the poison into the circulating system, or communication with the mass of fluids: the other, whether the
 absorbing

absorbing vessels, as by an universal law belonging to their nature, after a due time drink up the poisonous saliva inserted in the wound, and carried to the general mass to be mixed with the blood, &c. and thereby in a secondary manner acting on the nerves and propagating the disorder.

The latter has been the opinion generally received as the most obvious and natural; and till within a few years, considered as the indisputable channel through which the venom was presumed to be put into action. The former, however, has of late obtained many able advocates, and abstruse reasoners to its support. It will be unnecessary to search among authors of antiquity for the first movers of this opinion. It is a matter of little moment. I shall instance Morgagni and Sauvages among the moderns, where I have first found traces of this doctrine. In their writings on Hydrophobia they are both more inclined to view the disease as induced by an irritation communicated to the nervous system *immediately*, than by an infected blood, through the veins, or in other words, *mediately* by absorption.

I shall mention as the next, without being particular as to accuracy in this respect, the

author of a paper in the Swedish Transactions for 1777^w. Here he concludes from the appearance of the blood drawn in the case under consideration, that “the disorder is not in the humours but in the violent agitation of the nervous system by a peculiar poison which attacks the *breast* and *throat*.” “When a fever arises,” adds he, “it must in such cases be in consequence of spasms from the irritation of the arteries, as clearly happens in the small pox, venereal disorder, and after the operation of the cataract.” Pursuing this train of reasoning, he is led to make strong objections to the antiphlogistic plan of cure universally adopted, and he puts the following question; “Is it not desirable for us to discover some powerful medicine for quieting the *nerves*, as would be able to quell this powerful *irritation*?” This hint on the improvement in the cure will doubtless be readily adopted at present by the favourers of either opinion. It is evident from these quotations, that he considers the irritation on the nerves and arteries as primary, and not in consequence of the poisoned fluids acting on them.

The

^w Vide Appendix for a Translation of this Case.

The next whom I find treating the subject in this light, is M. Roux of Dijon. This acute writer published his opinion in drawing up some cases of Hydrophobia for the Royal Medical Society at Paris, in the second part of their Memoirs for 1783^x, or about six years after the former paper in the Swedish Society's Transactions.

When the virus is inserted into the wound, he is of opinion, that it is not then *altogether* venomous; yet with a tendency and disposition to become so: and that it requires a considerable time before it arrives at the height of its virulence, till which it is incapable of exciting the disease. One of his principal objections to the production of the malady by a diffusion of the virus through the system, arises from the weakened state which must succeed so great a dilution and separation of its particles. He cannot conceive, how thus weakened, the venom could excite Hydrophobia. For in order to this it must remain at rest, and be out of the reach of circulation or vital action, as it is expressed. In support of this

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theory

^x In this volume of Memoirs, the reader will find several curious communications:

theory he brings forward several examples which to him are sufficiently strong to establish it, and on which he founds his method of cure^y.

The next again in order whom I shall mention, as maintaining the doctrine of *primary* nervous irritation and sympathy exciting the disease, is Dr. Percival. He does not admit the analogies between Hydrophobia, and lues, variolæ, or the poison of the viper, nor consequently of absorption, whereby the mass of fluids are tainted. Instead thereof he refers the whole to local irritation, first communicated to the brain, and thence reflected back to the fauces^z, &c. Nervous irritation appears propagated in this manner in the aura epileptica, and this disease frequently follows such a sensation. On this ground, ligatures which have been occasionally useful, have been lately recommended in Hydrophobia, in order to arrest its progress by benumbing the nerves near those parts from which it is supposed to take its origin. This eminent physician

^y Vide Appendix for a short Analysis of this Paper, with several others from the same work.

^z Vide Essay 10. vol. 2.—Hints to Dr. Haygarth.

fician does not seem entirely confident in this doctrine, for he ingenuously confesses, that “ we are ignorant of the peculiar properties of the canine virus ; of the *mode of its communication* ; and the parts of the animal system affected by it. Are we then qualified,” says he, “ to advance one step beyond conjecture^a ? ”

Dr. Rush takes the subject up somewhat in the same light. He views this afflicting malady as bearing a near relation to tetanic affections. The latter is produced from wounds, from irritated nerves and tendons, affecting the organs of deglutition, producing locked jaw, &c. and arising also from other debilitating causes. The former proceeds from wounds, from irritation on the nervous system, especially in the spontaneous Hydrophobia, as in violent passions of the mind, from Hysteria and other affections induced by debility. In this they bear a strict alliance to one another. Instances are numerous where a disease in all its symptoms similar to Hydrophobia has taken place from conflicts of the mind, and each of the sources here enumerated; and Tetanus and Hydrophobia

D 3 having

^a Ibid. page 315.

having changed sides, as it were, ought to be combated, in his opinion, and it seems to be just, by the same set of remedies, viz. whatever strengthens the habit and obviates debility.

Dr. Mease has produced his analogies from the same sources, and reasoned much in the same way with his respectable preceptor. His conclusions are, that the disease arises from a morbid state and irritability of nerves, in the same manner with tetanus; and some of his proofs to establish this doctrine are drawn, first, from speedy putrefaction after death being equally observable in the tetanic and hydrophobic subject: and, secondly, from the occurrence of dimness of sight, and even blindness, together with paralysis and numbness of the limbs. These he considers as unanswerably fixing the affection in the nervous system, excluding every idea of absorption. According to him, there “subsists a morbid local affection of certain parts, which are afterwards rendered manifest on the application of particular causes.” These are the parts to which the poison is first applied. The locality of the poison in the part where it was first conveyed till the appearance of
the

the disease will not be disputed; but his proofs of its not entering the general habit which are brought from the bitten person's passing through other diseases before the appearance of Hydrophobia, may not to all be so conclusive: they may admit of an explanation on different grounds.

Dr. Bardley, in his feelingly described case of the unfortunate Lindsey, has given us an excellent epitome from various authors of cases respecting this disease, and has brought together several scattered facts, relative both to the spontaneous, and inoculated species. His sentiments respecting the manner in which the disorder arises, evidently lean to the same side. From instances quoted he concludes, and certainly his reasoning bears with it much weight, "that the occasional causes productive of spontaneous Hydrophobia," (he is chiefly inquiring into this) "operate either *locally* or *generally* upon the nervous system, by increasing its irritability, and at the same time inducing debility. It is also sufficiently evident," adds he, "that the action of the canine poison produces similar effects. But its superior mischievous activity, in comparison with any other occasional cause, cannot

be denied. Yet I apprehend we ought to attribute the more fatal virulence of the canine poison, rather to the *difference in degree*, than to the *nature* of the cause. For undoubtedly, the *identity of effects* warrants the conclusion of an *identity of the cause.*'

Dr. Darwin, the latest author on this subject^b, appears an advocate for irritation. From a difficulty of deglutition induced by wounds of different kinds, especially in tendinous parts, soon after infliction, he supposes that Hydrophobia arises from diseased tendons merely; and therefore bearing a strict analogy to tetanus. Several cases of this kind are on record, where Hydrophobia strictly so called, and death has succeeded wounds from nails, from splinters of wood, from the splinters of a fractured bone pricking neighbouring parts, &c.

He allows also a second analogy equally strong, viz. that which subsists between it and the disease occasioned by the bite of a viper and other poisonous reptiles, both arising from the insertion of a stimulating fluid into a wound. In its rapid progress and speedy termination, it has, according to him, a strict
similitude

^b Vide Zoonomia, vol. 2.

similitude likewise to contagious fevers^e. To each of these we admit the analogy; but the first^e would appear a distinguishable case from the second. The early commencement from the application of the cause in hysteria, &c. forms a marked difference; and difficult deglutition alone must not be considered as pathognomonic. The second and third analogies appear more applicable to rabid Hydrophobia, and bear to it a strict relation.

With respect to diseased tendons in consequence of a bite from a rabid dog, exciting Hydrophobia, it may be observed, that such bites are not always received in tendons or tendinous parts. They are as often inflicted in muscles merely, as otherwise, and at a distance too from their insertions; therefore, there

“As Hydrophobia “happens in *some* hysterical cases; hence it seems rather the immediate consequence of a pained tendon, than of a contagious poison. And is to far analogous to tetanus, according with the opinions of Dr. Rush and Dr. Percival.”

“In other respects, as it is produced by the saliva of an enraged animal instilled into a wound, it would seem analogous to the poison of venomous animals. And from the manner of its access so long after the bite, and its termination in a short time, it would seem to resemble the progress of contagious fevers.” Zoonomia, vol. 2. page 347.

there will be difficulty in admitting diseased tendons universally as a cause. I am inclined to think, this respectable author, from the analogy he admits between the disease produced by a rabid dog, and that from the poison of venomous animals, is himself uncertain respecting local irritation independent of the excitement of the malady by absorption. Be this as it may, his plan of cure which is to obviate debility, founded upon principles similar to those of Percival and Rush, merits the practitioner's attention.

Dr. D. asks here a very pertinent question; whether the cardia be not the seat of Hydrophobia^d. He refers this to association; as in cardialgia the pain is felt in the pharinx though the irritation by the acid materials is given at the other end of the tube, or mouth of the stomach.

Without dwelling farther on the subject of primary and local irritation, let us take a short review of the second opinion, viz. of *absorption* of the poisoned saliva, and the general infection from thence of the system, in consequence

^d "Is not the cardia ventriculi the seat of this disease?"
Vide Zoonomia, vol. 2. page 158.

quence of which the nerves are *secondarily* thrown into inordinate actions giving birth to the malady.

I ought to apologise to the medical reader, for the introduction of the following short anatomical sketch of the absorbing system, so well understood by him, that barely to mention the word is sufficient. My readers, however, will not be all conversant with medical subjects. To accommodate such, therefore, I would beg leave to premise, that there are, as forming a part of the animal machine, a series of vessels, termed lymphatics or absorbents. These are dispersed plentifully over every part, as well external as internal. Their uses are to separate the nutritious part of the aliment from the feculencies. By this means it is conveyed to the blood, and circulates with it, where it is again farther elaborated into flesh, bone, cartilage, tendon, ligament, &c. by the different organs adapted by nature for making these new combinations. They drink up, in like manner, the superfluous lymph left in cavities, &c. where it has been deposited by another order of vessels, named exhalents, and brought hither by them for useful purposes. The absorbents also open
numerously

numerously over the external surface of the body in all animals, the dog tribe not excepted, though with some difference in this class. This is abundantly proved from the inhalation of fluids, whether watery, or elastic and aerial, applied externally to the skin. Instances of the one we have by the absorption from the atmosphere which takes place in diabetes; while Mr. Abernethy's^e experiments are satisfactory with respect to their taking in elastic gases. Subtile effluvia do not escape them. Thus, we find the strong smell of garlic in the urine soon after a plaister of the same is applied to the external abdomen; and a violet smell is soon perceptible in the same secretion, communicated to it through the intervention of the absorbents, after oil of terebinth has been kept for some time in contact with the external surface, especially of the part already mentioned.

As we cannot wound the smallest portion of the skin without opening some of these, whatever comes in their way sufficiently minute to circulate in them, is drank up, and, by the assistance of valves with which they are furnished, carried onwards to a general receptacle;

^e Vide Essays, Surgical and Physiological.

ceptacle; thence passing through it, mount, like water in a common pump, to a vein under the left clavicle, dropping with its contents immediately into the heart, mixing with the mass.

It is by the intervention of these we can ingraft diseases, such as the small-pox; it is by these, the venereal poison, that just tax on the illicit commerce of the sexes, as well as several other infectious maladies, is received, contaminating the body and enfeebling the constitution. In like manner, the introduction of the poison from rabid animals has been hitherto explained by several of the acuteest pathologists of the present times.

From this short sketch of the structure and offices of these vessels, and according to the view here given, it will readily appear, that whatever is presented to their mouths, be it nutriment or poison; be it lymph or gas; they will, after a certain time, proportioned and determined by the species of matter to be received, drink it up: and it is likewise evident, that if their contents can be intercepted in their passage towards the heart, whether they be nutritious or poisonous, and the seeds of
future

future diseases, the effects must be prevented. This admitted, we have found a clue to guide our way.

It is no easy task to determine *à priori*, the exact time that the rabid, or indeed any other poison remains local, or when it moves forward, rendering it impossible to arrest its progress. This depends on a variety of circumstances; among others, on the state of the habit at the time to receive it; but principally, perhaps, on the nature of the poison itself, which is to be known only by multiplied observation.

The state of the body at the time when a poison, or the seeds of this, or other infectious diseases are received, has, indeed, very great influence. Many, on this account, independent of other causes, escape while this condition of the habit continues. This invigorated state, to which we may give the name of *insusceptibility*, though the poison be conveyed to the blood, prevents its action; but a contrary state or a weakened energy, which may be denominated *susceptible*, more readily admits the impressions of the noxious matter, and a disease soon becomes excited. In these two
opposite

opposite conditions, some subtraction or addition would seem to have been made, giving a new form, perhaps, to the nerves and moving fibres.

A practical Physician has many opportunities of ascertaining this fact. Persons themselves have assured me of the anxious wish they entertained, before inoculation was common, to pass through the small-pox, and that they took pains, and those not small, to catch the distemper, yet at that time they escaped; and though exposing themselves repeatedly to the infected, the habit, resisted the poison. It was years after this before they caught the disease, and then knew not how they became affected.

A Clergyman in this neighbourhood, frequently went to a house where the disease raged, and raged too with considerable severity. He laid his hands on the infected person, and took some of the pus on his fingers; he wiped his face with a handkerchief which was on the bed, and which the person under the disease had used; he smelt to the linen, and took the patient's breath even into his mouth. All did not at this time induce the complaint;
several

several years afterwards the disease seized him; and at a time it was not in the neighbourhood, when he suffered severely^f.

It is the same with other diseases. The habit is found sometimes to resist those of the most infectious, and virulent.

What the state of body exactly is that gives rise to this insusceptibility at certain times, cannot, I apprehend, be easily explained. Is it connected with a high degree of excitement of the system; or in rigidity of fibre? Maniacs, I believe, are not so subject to fevers of a contagious kind, as those whose bodies are in a different condition, and their mental faculties in health. During this derangement of the mind, their bodies are in a high degree excited; their strength is augmented five fold; they can bear hunger and cold, and all other debilitating causes, to an extent that would prove fatal to persons of sound mind.

Strong affection also and attachment would seem to induce this change, and create this insusceptibility. It endows the person under its

^f This relation I received from himself. He had not been out of the parish, nor had mixed in company with strangers for a considerable time before.

its influence with a kind of heroic, I had almost said, ferocious courage; fear is banished, and self preservation disregarded. When the object of attachment is in danger, they will rush forward to afford protection with unrestrained impetuosity, forgetful of their own fate. This produces a high state of excitement for the time. We shall illustrate this by the following example.

In the year 1636, when the plague raged in Holland, a young girl, as we are told, fell ill of the disease. She had three carbuncles, was supposed irrecoverable, and was therefore removed to a garden to die; but here she was not abandoned. A faithful lover, a young man to whom she had betrothed herself, accompanied her, and acted as her nurse; nay more, says the account, he slept with her as his wife. She recovered, while he remained uninfected, and was afterwards married to her^g.

A second instance where a sense of duty banished fear, and determined resolution gave tone and vigour to the system, and it would appear occasioned an escape from the plague, is afforded by the following fact. When the

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same

^g Vide Misc. Curios. ar. 2. obs. 188. The anecdote is there related by Vinc. Fabricius.

same disease spread last over Marfeilles, a number of dead bodies were heaped together in a certain part of the city. To prevent the putrid odour which exhaled from them, and hourly spread the contagion, the governor, a man of great humanity, regardless of his own safety, but anxious for that of his fellow citizens, resolved at all events to remove them. For this purpose he ordered a deep pit to be dug for their inhumation; then marching forth at the head of eighty grenadiers, set the example himself by dragging the first body into the pit, where in a short time, these masses of corruption were all deposited. During this operation, eight of the men died on the spot; at night they were all dead but one; the eightieth survived only a few days. The governor, however, who, like another Decius, had bravely exposed his life, remained uninfected^h. Did not the fortitude which animated his noble mind communicate to his body this insusceptibility to the infection?

In the case of the Clergyman just narrated, we have seen this insusceptibility; and in various instances in the inoculated small-pox, a practice in which I have hitherto been much engaged,

^h Vide Medical Commentaries, vol. 4. page 372.

engaged, I have found it well exemplified. In one person the inoculated part would not inflame, but healed up like a common cut; in another, the infection from the same pock, would at once take effect. Sometimes the matter has been inserted three different times before it succeeded, and in some cases did not succeed at all, though the rest of the family regularly went through them. Several of the female nurses, who attended my patients, have observed to me, that they had long nursed in the disease before inoculation was in use; and that they did not shun communication with the disease though they had not passed through it; but have nursed for years without being infected, and continued the business from an idea they would escape it, for this is the case with some; yet afterwards they unexpectedly fell ill and passed through the complaint. In one case I inoculated three different times, and it was fourteen days after the last insertion before the eruptive fever commenced.

Others have likewise observed this temporary insusceptibility. Mr. Loftie speaks of a child at the breast, who for a fortnight and more was in the same room where four or five children were ill, and some of them with the

confluent kind ; yet at this time it escaped the disease.

Debility, for the most part, however, is the nurse of infection, especially of such as gives rise to fevers of the putrid type. A person in this state of body is more liable to be infected than one in a contrary conditionⁱ. The same observation holds in fevers arising from marsh effluvia. Valetudinarians, when exposed to marshy

ⁱ If it could be absolutely proved that the addition of oxygene communicates vigor and *vice versa*, an explanation would be immediately afforded. It certainly gives the red colour as well as heat to the blood, and this last is as certainly connected with vigor. If we abstract oxygene, or in other words, prevent its entrance into the body, the pulse is rendered less frequent and less strong. This fact Dr. Beddoes, (see his Considerations, part 5.) proves by a simple experiment. Breathe as slowly as possible without giving great uneasiness, taking at each inspiration only a very small portion of air into the lungs. Examine the pulse during this operation, and its less frequency as well as weakened pulsation, is discovered. Here, as a smaller quantity of air is admitted, a proportionate smaller quantity of oxygene likewise enters; less heat must be evolved, and the pulsation affected in consequence. Depression of spirits weakens the habit. In this state the blood circulates slower and less freely. Hence the deep and involuntary sigh or enlarged inspiration, which for a time removes the uneasiness. Under the influence of this condition, less air is inspired and less oxygene; but the deep sigh which gives an additional quantity for a moment, and for a moment also removes the impediment to circulation or adds a momentary vigor to the heart

marshy situations, seldom long escape; the strong may at last suffer, but they are proof against the effluvia much longer. This is too well established to be controverted, but how far will this hold in the case of poisons from noxious, or rabid animals? Many concurring circumstances may take place to accelerate, or retard infection; and peculiarities of fibre at the time of the insertion of any poison, is sufficient to impede or obviate its operation, to a certain degree, as has just been shewn.

Experience teaches, that different poisons require different periods of time before they exert their force. But these periods, allowing for idiosyncrasy, or habit of body when received, are pretty regular with respect to the same poison. Thus, the small-pox, for the most part, appears from the eighth to the tenth day after inoculation; the poison absorbed from unclean embraces has likewise its period, allowing for the state of the body at the time

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of

heart to impel the blood forward. Fear induces a depression of spirits, and fear is a well known exciting cause of disease. Hilarity, or an opposite condition, is an equally well-known resisting cause. Under this state, both freer and quicker inspirations are made, and more oxygene, with more heat, is added to the blood and greater vigor to the body.

of its application. It appears, that the same mode of reasoning may be adopted in explaining the action of rabid poison at different periods from reception. If we average from a sufficient number of cases, and there are enough on record for the purpose, the result will shew a period from five to six weeks from the accident, to the first intimation of the approaching disease.

It would, I think, be no useless labour to form a scale of the virulence of different infections by marking the distance between the time of exposure or contact, to the appearance of the first symptom of the respective malady; in tracing this we shall find a vast range between the most powerful and the weakest infections. The poison of some venomous reptiles act almost instantaneously; and the interval between the insertion, the first symptom, and the fatal termination, has been but a few minutes. Others of a less powerful nature have exerted little or no influence till after several hours; others not till several days; while others again have been protracted to months, and even to a year and somewhat upwards. It is scarcely necessary to add, that by the last I mean the rabid poison. Chisholm
has

has stated the distance between the application of the infection in the yellow pestilential fever at its latest period, making allowance for temperament, not to exceed four days till the first symptom manifested itself. “In some instances,” says he, “symptoms of its action have appeared in six hours; in others, in twenty hours; in others, in forty-eight; and in others, not till the expiration of the fourth day.” This species of infection I consider as amongst the most powerful.

We may observe here another instance of constitutional retardation, or the effects of that state of body under which the individual laboured, giving a variation, and latitude of action to the same poison from six hours to four days. Will not this analogy assist in explaining the difference of time necessary in different individuals, to bring the rabid virus into action, or fit it, as some would argue, for absorption?

Contagion of the plague, according to Dr. Guthrie, appears about the fourth day from contact; he draws his conclusion from the instances he received of it from the Russian army. In the small-pox, the inoculation of which enables us with precision to mark the

period, the distance is from the infection to the first symptom nine days, at a medium; but by habit and temperament it varies, on some occasions, to fourteen. When this disease is received in the natural way, without the intervention of a wound, the first symptoms appear some days later; seldom if ever before the fourteenth. In other contagious diseases there appear likewise to be periods peculiar to each, giving to each individual its specific nature and distinction.

A young patient was removed for safety to the distance of eighteen miles from his brothers and sisters, who were ill of the scarlet fever. About ten days after he took the disease. None were ill of it in the place to which he was removed, nor had been for a long time, perhaps years, before. He must therefore have received the infection previous to his removal. It is evident from thence that the infection of this disease, is latent about twelve days before it comes into action; for the disease had but just become manifest, when, from the alarm of the family, the boy was sent from home.

Dr. Rush, who is inclined to think, that consumption is infectious, states the period
between

between the time the matter was first received, and the beginning of the diseased action in the habit, to be about three months. If I am right in my conjecture, that poisons act sooner or later according to their specific nature, and the state of the habit to be acted on, then consumptive infection must be at least as weak as the canine poison; for the latter is frequently brought into action, as we shall see hereafter, at a much earlier date.

Some persons, we know, after receiving the canine virus, have continued well to a much later period. This may be referred to a peculiar state of body at the time, as we have seen in other poisons; but I deny the existence of any well-authenticated case in the records of medicine, where years have intervened. When we meet with such stories in authors, we may fairly treat them as fabulous. Opinions of this kind have done great mischief, both to individuals and to science; things should be well examined before they are admitted as truths. It is well known, that many opinions in medicine were taken up by men eminent, it is true, in their day, and therefore had some authority stamped on them; but which were opinions merely, not only without facts,

facts, but almost probability to support them; and thus several of them have for generations, and do even at this day, in spite of the advanced state of science, prevail. They were produced by chance; and we ought to remember, that they were disseminated in times of obscurity.

If to these poisons, likewise, under different circumstances, we allow different degrees of virulence; this, united to the state of body, idiosyncrasy, or constitution already mentioned, will assist in forming the variations we observe relative to the propagation of their respective diseases. There is a period of the small-pox, at which the matter is found more infectious, i. e. more apt to come into action than it is at another, as is well known to those accustomed to ingraft the disease. There is a time also, perhaps, when the saliva of an infected dog is tainted with a higher degree of virulence than it is at another. Something in the variety we observe in the symptoms both of the dog and animals he infects may be placed to this account, as well as to constitution. Whether this be the last stage, I dare not say; but we see in this stage that the saliva is secreted in somewhat greater abundance.

dance. This would be a fact worthy of ascertaining. We know indeed that they can infect when no preternatural quantity is secreted, and at a very early period of the complaint. We more certainly communicate the small-pox on the first days of the eruption. Whether this be, that the ichor is more virulent, or that it is now only less involved in mucus and glutinous particles than at a later stage, especially at the turn of the pock, has not, I believe, been positively ascertained; or whether, as some later experiments seem to indicate, the quantity, or dilution of the pus, affects the quantity of future pustules, and the mildness of the disorder¹. In the case of poison from venomous serpents this holds true. Dr. Barton^m has instituted some experiments on the poison of the *crotalus horridus* (rattle snake), to which the reader is referred.

In the season of langour and torpidity, this serpent, he tells us, bites with seeming reluctance, and without any, or with but little ill consequence. But when the season is advanced, and the sun powerful, it bites with virulence, and destroys life in a short time. It is

¹ Vide Beddoes' Considerations.

^m Vide American Philosophical Transactions, vol. 3.

is even often found, that at this time the cavities of the venomous fangs are destitute of their active poison; the same most probably happens from their frequency of biting, which exhausts the venom faster than it is secreted; and indeed this is fully proved by the Doctor's fatherⁿ, at Philadelphia.

He procured a live rattle-snake, and by a string so managed it, that he could lead it into or out of the cage in which it was kept. On the first day, he suffered it to bite a chicken, which had been allured to the mouth of the cage by crumbs of bread. In a few hours, the bird mortified and died. On the second day, another chicken was allured to it, and bitten in the same manner; it survived the injury much longer than the first. On the third day the experiment was repeated on another chicken; it swelled much, but recovered. On the fourth day several chickens were bitten without suffering the least injury. Dr. Mead, in examining into the poison of the viper, discovered this difference also in degrees of its virulence; and attributes it very properly to the state of the animal combined with the season of the year. The rage of the reptile
has

* The M. S. account of these, is it seems, in his possession.

has no other effect than to cause it to inflict a wound with greater force.

But to return to the action of the absorbents; they perform their office, it is true, with celerity, yet from what we have advanced before, it is apparent, that the celerity of their action varies with the nature of the poison; it varies, likewise, in what relates to the habit; and it *may* vary, also, according to the mode in which it is inserted. Should it be thrown directly into the mouths of some of them, which is what may happen, its entrance into the blood will be speedy. And should they be exposed to moderate cold°, or any stimulant substance be applied to them, their propulsive power may be encreased, and the rapidity be the greater.

Facts do not go, however, to prove this suddenness of absorption in any well-attested case of Hydrophobia. It is always latent a certain time; yet we may suppose that in most cases it is in contact with the open mouths of lymphatics. We have seen that other specific poisons remain latent in the same manner: a certain time seems necessary to fit them for absorption. I speak chiefly now of the small-pox and venereal poisons. Among the animal
poisons

° Great cold benumbs them and retards their action.

poisons there seems to be a strict analogy ; and perhaps by well investigating the nature of one, we investigate the nature of all.

Does the distilled water of the laureo-cerasus act by absorption ? Dr. Nichols found that it killed a dog in less than half a minute. This would appear to be sooner, perhaps, than it could be conveyed by the absorbents to the system.

Dr. Madan found this vegetable poison prove fatal in a few hours ; and this took place whether applied to the stomach, or thrown up the rectum by clyster^p. As its effects appear so speedily, either after being swallowed, or injected *per anum*, its powers must be exerted on the nervous system as speedily ; but whether without the intervention of a set of vessels to convey it to the general mass, I would not affirm. The inner surface of the stomach is, indeed, thickly covered with *nervous filaments*, and the sensibility of this organ is thereby rendered extremely acute. A poison, on touching these, may give so great a shock, that the whole machine may instantly partake of it, and from this alone death follow. This seems to have been

^p Vide Wilmer's Observations on Poisonous Vegetables.

been the case with the rabbit in the experiments of Fontana^a, the death of which instantly succeeded the poison of the viper, when injected into the jugular vein.

An infectious irritation, like others, requires time before it affects the resisting and assimilating powers, so as to produce the specific state of vessels and specific matter^r. This by *no means* goes to exclude the possibility of absorption, or to deprive this set of vessels, so uniform in their operations in the animal œconomy, of a part in the process of conveying this, or other poisons, to the habit, provided they find not a readier or more expeditious way of entering.

It is clearly evinced, and beyond the possibility of doubt, that there is in them an active power, disposing them to lay hold of things, if small enough to enter their mouths, the virus of rabid animals as well as other matter. And to prove that this virus is absorbed in the manner we have endeavoured to describe, we shall bring a clear analogical argument from the small-pox.

Let

^a Vide Fontana on Poisons.

^r Vide Webster's Connections of the Stomach with Life.

Let us, some days after inserting the varicellous matter, cut out the part, and no small-pox will appear ; no fever shall be excited in the system ; it is nothing now but a local complaint, unconnected with the habit at large. Experiments have been instituted for this end, and the event has corresponded with the doctrine of absorption. It is difficult, however, to determine at what time exactly after inoculation this can effectually be done, because absorption takes place sooner or later, from the varieties and peculiarities of temperament already hinted at ; but it is probable it would succeed several days after insertion, and at any time previous to the commencement of the eruptive fever. For had the absorption been earlier, so would the commotion in the sanguiferous system ; but since no change has taken place, till this time, I hold the disease to be local, and that the pus till now remained in the inoculated part.

We frequently find, in this disease, that the patient, a little before or about the ninth day, complains of a pain in the course of the lymphatics, and in the axilla of the inoculated arm ; or if it be in the leg, in the course of the thigh, or in the groin, where lymphatics
and

and lymphatic glands lie. In like manner, as absorption happens here, so does it in the venereal disease; swelled lymphatics and glands may be discovered here also irritated by the poison they are conveying to the blood.

Though this constantly precedes the febrile symptoms in the one, or the peculiar symptoms that constitute the other relative diseases, yet, were we to make our experiment *now*, it might not be decisive; it might not prevent the progress of the malady: for enough of the poison having been carried beyond the reach of the knife to propagate the respective disease, the removal of what remains in the part where it was first inserted, would not answer the end; our experiment here would fail; it would prove nothing. But should this be done at an earlier time, when from the inflamed appearance of the little scar we might with reason conclude, that the disease, if not interrupted, would be communicated, we may rest assured that our experiment will be decisive.

If absorption takes place in the variolous and venereal diseases, if it takes place, likewise, from the infected poison of the rattlesnake, viper, and other venomous reptiles, which, from the experiments of Fontana,

seem proved; and if it be allowed that the same takes place in some of the narcotic vegetable poisons, as is proved by Professor Monro^s in the instance of opium; if the same happens, likewise, and it will be difficult positively to deny it, from the distilled water of the laureo-cerasus, we shall find sufficient analogical reason to conclude, that a similar process goes on in the case of rabid poison.

An argument is urged against absorption in Hydrophobia, from our unsuccessful attempts to trace the virus, either by pain in the course of the lymphatics, or swelling in the gland between the part where the poison was first inserted, and the subclavian vein^t. But an objection of the same nature might be urged both against variolous, and venereal poisons. For lymphatics, and lymphatic glands are not observed, in every instance of these diseases, to be either inflamed or painful in conveying the
respective

^s Vide Experiments on the Nervous System.

^t Both Zwingerus and Scaramuccius, according to Morgagni, treating of the re-inflammation of the scar, affirm that it extends from the part (supposing the hand), upwards to the axilla; a proof that the poison has been traced to the gland.

Vide Morgagni, epist. 8. § 21.

respective poisons to the blood. It is certain, that numerous instances occur where nothing of the kind can be traced ; and yet absorption does take place, and the disease follows in consequence. This difference appears to arise from the state of the habit at the time, and the constitution in general, being more irritated and thrown into inflammation in some individuals, whereby the lymphatics, I mean the cutaneous, which the eye can trace, will exhibit marks of inflammation, though in a different habit the same cannot be seen. An incapability of tracing them may likewise proceed from a deviation in their common course. Should the lymphatic conveying the absorbed virus sink in among the muscles, instead of pursuing a more superficial passage, and then anastomose with others still deeper, the matter will be carried to the blood, and no human eye can discern the smallest marks till its effects are discovered on the system at large.

Every person engaged in the inoculation of the small-pox must have frequent opportunities of observing, that the poison will find its way, imperceptibly, as it were, into the habit, without producing either pain or swelling in

the arm or axilla: but an argument must not be drawn from thence, that an irritating poison does not produce inflammation, or that absorption is not performed, when inflammatory marks with pain do not follow.

What has been said of the small-pox will apply to the venereal disease; I speak chiefly of *lues*; for a buboe is an inflammation of the gland. But I know, from much experience in this disease, during some years practice in the army, that *buboes* do happen, where no pain, no external marks whatever of inflammation in the lymphatics leading from the penis and urethra to the gland in the groin, has been discovered either by the eye, or by the patient's sensations. I do not speak here of sympathetic buboe; it is the buboe from infection I have in view.

That absorption has taken place and carried the poison hither we are certain, and it might be done with some degree even of inflammation, and yet escape our penetration, or through the medium of a vessel deviating from the usual course, and anastomosing with others still deeper seated. This last is a case I believe often occurring, a *lusus naturæ*, in the structure of this part of our system.

With

With respect to poisons exciting disease; there are some of a far more irritating nature than others, that very speedily communicate their effects, independent of any peculiarity of the system. The poison of the rattle-snake, and of the viper we have quoted as of this sort; yet to deny absorption, even here, would be precipitate; nor must we infer from others, because they lie dormant for a length of time, that when they are brought into action, that it is independent of the intervention of the lymphatics.

The rabid poison is long latent; it is longer than most others before it excites the disease named Hydrophobia; but we must not conclude that absorption did not precede it; for it would be depriving an universal system of vessels, that exist in every animal, I believe, perfect, and imperfect, of the office universally allotted to them, and giving to irregular chance what belongs to a regular law in animal life.

Matter of any kind, when presented to the mouths of the absorbents, minute enough to enter, will be taken up. Matter from a cancer; from a putrid body. Surgeons have ex-

perienced this. Dr. Walsh perished^u from a fever brought on by acrid matter, absorbed from a small wound in dissecting a putrid subject. He scratched his finger, and instead of cutting out the part, as a bye-stander wisely advised, he washed it with warm soap and water only, and applied to the sore some oil; but it was absorbed, and a putrid fever was the consequence, which proved fatal in three days.

Different stimulant substances of different irritating qualities, or in some manner differently fitted for entering their mouths, though both should be inserted into the same wound at the *same moment*, will be both absorbed, but *not* at the *same time*; their different compositions and properties seem to give one a preference to the other: the lymphatics will lay hold of *this*, rejecting *that*.

From some late experiments of Mr. Abernethy we are led to conclude, that the removal of *oxygenous*, in preference to other kinds of air, is the effect of an active power in these vessels. In the experiments alluded to, he found the *oxygenous* and *carbonic* gases readily imbibed; not so the *nitrous*, *hydrogenous*, and
nitrogenous

^u January 1, 1788.

nitrogenous gases: it was with difficulty that the absorbents admitted them. This is an useful physiological fact, and may hereafter lead to other important conclusions.

We have a proof of the elective power of the absorbents in a case laid before a Society in London. Dr. J. Hunter making some observations on this subject, affirms, that in one of the patients, whose history was communicated to the Society, the *bite* immediately *inflamed* and *festered*, and on the *fifth day* an absorption took place, as appeared by the swelling of a gland in the arm-pit, which was followed by a considerable degree of fever, that lasted some days; but *none* of the *symptoms* of *Hydrophobia* appeared till the usual period, and after *signs* of a second absorption, when the disease proved fatal^w.

Several experiments have been instituted on living animals, which prove the absorption of different kinds of airs at different periods when injected into the cellular substance, forming an artificial emphysema^x. Dogs and rabbits

E 4

bits

^w Vide Memoirs of a Society for the Improvement of Medical and Surgical Knowledge.

^x Vide Beddoes' Considerations.

bits of different sizes were subjected to these trials; in two of which, where nitrous air was used, the smell of the gas was evidently perceived when the lungs were inflated and left to collapse; a proof incontrovertible, that the absorbents contiguous to the cellular texture had carried it to the blood, whence it was diffused through these parts.

If, as in these instances, the gases are absorbed when introduced below the cutis, the same, we may conclude, will happen to any matter if small enough to enter the mouths of lymphatics; though according to the matter it will be at different distances from its application; and this would appear to be in proportion to its irritating and stimulant powers. Shall we venture, then, to deny absorption after the application of poison to an abraded surface, or more deeply wounded parts? Are the lymphatics suddenly rendered unfit for their office, and totally inert? This conclusion seems unwarrantable. Absorption, Mr. Hunter^y supposes to be performed by an active power in the mouths of the lymphatics, which may have different modes of action, according

^y Vide Hunter's Works.

according to the substance taken in by different animals; the mouths of which vessels would vary accordingly.

This doctrine is, perhaps, corroborated by the instances of nitrous air on rabbits, and by the experiments of Mr. Abernethy^z, and may be applied as a farther proof of our position. We have seen that he found certain substances which they took up with *less avidity* than others presented to them. I think it may be fairly inferred, that the poison of a rabid animal is also of a nature not to be *speedily absorbed*; but which like the virus of the small-pox, and several other poisons, will at length pass through them into the habit.

Such is indeed the activity of this system, that parts of the hardest bones have been taken up by them when found corroded, and the carious particles removed from the inside of the skull, and not a vestige left. This is a still farther illustration that every thing presented to their mouths, when fitted to their capacities, is taken up. Would it not be unphilosophical to reason differently of the canine virus?

But

^z Vide Abernethy's Essays.

But it may be asked, can any wound, whether of a poisoned or simple kind, incarnate without this previous process? None surely. When a wound is made, the edges become dead matter; the living principle continues its operation, and this dead matter must be cast off, and is in reality removed by the absorbents before the new and living parts can unite to form a cicatrix and restore the loss. It is apparent therefore, that, be the nature of the wound what it may, whether simple, ulcerous, or poisoned, absorption precedes the cure. Yet absorption of the poison, according to the foregoing supposition, is not always performed when a cuticle covers the external wound; and we have given an example where two different poisons inserted together, have, at different periods been carried to the general mass, though by the incarnation of the fore an absorption of a third kind of matter (the dead sloughs from its edges) must have gone on, otherwise an external cuticle could not have been formed.

It has been urged against absorption, that when a wound by a rabid dog is inflicted, it heals as readily as an unpoisoned sore, or as a
common

common cut from a sharp instrument. And, since it exhibits no marks of inflammation, or rises into a pustule, the matter, according to these reasoners, has neither reached the lymphatics nor the general system. Strong objections may be taken to this argument. Although this really does happen in many instances of rabid wounds, it is rare if the cicatrix fails to re-inflame at a certain time after incarnation, exhibiting evident marks of absorbed infection. The same thing, likewise, has been observed from bites by creatures that might only be termed *enraged*. A few days have perfectly cicatrized and covered the marks of the teeth with a fair cuticle, when a week or more afterwards a re-inflamed surface pointed out some latent mischief.

A farmer's servant^a employed in July 1796, with others of his fellows, in the removal of some straw in the barn, and with expectation of finding rats, prepared himself with his comrades for destroying them. In performing this they used their hands only, often catching them alive. One fiercer than the rest bit him on
the

^a Servant to Mr. Francis, at Bacton, Suffolk. The anecdote I received from the family soon after it happened.

the third phalanx of one of his fingers with feverity, and was with some difficulty disengaged. The wound healed, however, kindly in a short time, without any apparent mark of inflammation; but about ten days after its incarnation, the cicatrix re-inflamed; the hand and arm swelled; and the man, through the pain, was thrown into considerable fever commencing in the common way with nausea and sickness. A tight knotty cord, as he expressed it, stretched towards the arm-pit, where several small moveable tumours were felt painful to the touch. Alarmed at the state of his arm, and tortured with pain, he applied to a Surgeon, and two months elapsed before his complete recovery, which was not brought about till suppuration, and a discharge of pus from the inflamed glands took place.

Here is a wound inflicted by an *enraged*, not *rabid* animal. It heals like a common sore, and for some time remains apparently well. Irritation, however, from the animal's saliva (it is presumed), at length gave rise to a train of troublesome symptoms. Its re-inflammation marked the beginning absorption, and on its entering the blood, sickness and fever were the consequence; but had the
poison

poison been of a more deleterious quality, more violent symptoms might have ushered in death. Is not this a parallel case, and illustrative of the progress of rabid poison? The virus of a rabid animal, however, takes a longer time to fit it for absorption, or in other words, may possess some quality rendering it less stimulant, and less apt to enter these vessels; therefore it may be inferred, that it is of a *weaker nature* than many other poisons.

Although an external cuticle be formed in rabid wounds as readily, nearly, as in others, yet by the application of a blister over the re-inflamed scar, at the commencement of the malady, and the removal of the cuticle, a deep ulcer has been discovered beneath. Dr. Gray's patient is an example^b. Here an absorption of the matter of this ulcer must have been going on. It is dead matter, and extraneous with respect to the living and re-uniting process; the absorbents in contact must continue their office, and in removing it, we presume, would imbibe at the same time the inserted virus which produced this ichorous and unhealthy condition. The advantages that may result in the prevention of the disease from
observing

^b Vide Medical Commentaries.

observing this state, as well as the external re-inflammation of the scar, shall be reserved for its proper place.

Absorption also has been denied on the grounds that an inflammatory fever is, for the most part, the consequence of diseases conveyed to the habit through the medium of the lymphatics. The small-pox and measles have been brought as proofs of the objection. But no inference, in my opinion, can be fairly drawn from this source to disprove absorption of rabid virus. Symptomatic fevers are of great latitude, and are actuated by the strength of the cause giving them birth. Whether the pulse be strong or weak, hard or soft, is no proof on either side: nor is the fever absolutely necessary, I mean a fever giving evident marks to the patient by his feelings, and to others capable of remarking it, to introduce some poisons into the mass. *Lues venerea* arises from absorption; yet the fever, when it is apparent, is of a slow and creeping kind, giving little disturbance, as far as the pulse indicates, and exhibits little or no marks of inflammation.

That the virus of a rabid animal affects the arterial system is evident in every case after the
appearances

appearances of the disease; but it does not follow that this fever, or change in the mode of circulation should be of the inflammatory kind. It is the nature of variolæ, morbilli, and scarlatina to induce a change termed inflammatory; but it is not the nature, I believe, either of typhus carcerum, or of the slow nervous fever, or of pertussis to do this. Can we with any propriety deny absorption of a *specific materies morbi* because we have no marks of an inflammatory state of the body, indicated by a strong, hard, and full pulse; or because when blood is drawn there are no marks of a buffy crust on its surface? We must notice, however, that from some of the histories of the disease, marks of inflammation have been discoverable by the pulse; for it was *hard* and *full*; yet I would draw no conclusion from this circumstance, in favour of the preceding position. Diseases of debility often shew this in a temporary manner; a paroxysm in a convulsive disorder often betrays such a pulse for a short time; but this proves no more, than that now the system is suffering under strong irritation. The fit ends; the irritation soon ceases, or is lessened; the pulse subsides in proportion.

That

That this poison acts in a peculiar manner on the nervous system is indisputable---is evident. We need not now recite cases to prove this point. Convulsions, dimness of sight, dilatation of the pupil, paralysis, numbness of limbs, together with almost the whole train of nervous symptoms, point out how much this system of the animal frame is deranged. But is this a proof of want of absorption? All that can be inferred is, that the peculiarity of the disease brings these along with it as constant attendants. Will it be denied that such symptoms cannot be induced by an absorbed matter?

Opium produces its effects both by absorption, and by a local application to a part, where nerves are either laid bare, or are numerous, and thinly covered with their common defence. Professor Monro has put this beyond dispute. The peculiar symptoms produced when a greater quantity is swallowed than proper, are many of them evidently referable to the nerves. Dimness of sight, *muscæ volitantes*, and convulsions are the consequence.

Hemlock and several other narcotic vegetable juices induce the same: *risus sardonius*
and

and contortions of the limbs, starting of tendons, and such like. I entertain not a doubt of their acting by absorption. If the time after they have been taken till these symptoms appear be considered, I apprehend few will differ from me on this head.

In the year 1790, several German soldiers ate hemlock to dinner. They were quartered at Landguard-Fort in this neighbourhood at the time. They gathered it on the sides of the adjacent banks in mistake for some other herbs, which they had been accustomed to eat in their own country. Part they boiled in their soup, and part they ate in form of salad. It was several hours before its effects appeared; not till their dinner had sufficient time to digest. At evening parade they exhibited a curious spectacle, giving strong proofs of the activity of the poison; but all the symptoms with which they were affected, were more referable to the nervous system than to inflammation. Some were rendered so blind as to be unable to guide themselves; some staggered as if intoxicated; and were reprimanded on that account, by their officers; some shewed curious gesticulations, both with legs and arms, in walking, and in attempting to perform the

usual manual exercise; some kept constantly grinning, as if affecting to laugh. One or two were missing, and on inquiry, they were found in a state of insensibility at their quarters, in consequence of the quantity they had eaten. All of them, however, recovered, but some with considerable difficulty. In a word, so numerous are the absorbents, and so universal and uniform in their operation in taking up matters presented to them, that I cannot see convincing reasons, why, in the instance of Hydrophobia, they should be denied the exercise of their common office. Nature acts by few and simple laws; let us not uselessly multiply them.

Absorption in Hydrophobia has been denied likewise, on the grounds that bitten persons have undergone general diseases and have recovered from them, yet the accession of this disease was not prevented^c. The conclusion they draw is, that the virus remains in the part, affecting the nerves in contact, slowly and

^c Cocchi's assertion is doubtless alluded to here. "He affirms, that he knew *many*, who underwent the small-pox subsequent to the reception of the bite of a mad dog, and died of its effects after their recovery from the former disease." Vide Van Swieten's Comment. aphor. 1137.

and gradually till it has induced a sympathetic action over the whole nervous system, appearing with the peculiar marks constituting the disorder. This time, according to them, is altogether undetermined, and indefinite, and agrees with the variety observable in the commencement of the disease in different cases. This seems to prove nothing; for it may be referred either to the weakness of the poison, or its peculiar nature, forbidding it to be absorbed till after a period when some other diseases have begun and run their natural course, and again disappeared, according to the elective power in the absorbents already proved.

Other diseases of the system operate exactly in the same way. Let us exemplify it in the small-pox, measles, and scarlet fever. After the poison of either of these is received, a catarrhal affection has been induced. It ran its course, or admitted of a cure natural or artificial, within the intervening space, which one of these poisons require before the respective disease appears. No prevention, however, takes place on account of the catarrh, perhaps even little or no retardation; the variolous or morbillous fever was in due time excited, with the peculiar disease in its precise form.

The rubbing in of mercury, say they, and the use of general remedies have not prevented Hydrophobia. True. The same exactly is the case in these other maladies mentioned. Mercury in no instance has been able to subdue the variolous poison after insertion. When its period is complete, the absorbents fail not to remove it from its local habitation, pouring it into the blood, whence it soon covers the surface with its specific pustules.

Hydrophobia, we have admitted, exerts its violence on the nerves. Every symptom observable in the disorder serves as a proof^d. It is for this reason we must contradict the illustrious Boerhaave, in his denominating it *summe inflammatorius*, as neither the dissections nor other phænomena authorise the assertion. It is true, there is a species of inflammation which dissection detects, observable on the inner surface of the lower part of the œsophagus, and over the internal superficies of the stomach. This may be seen in the form of linear dotted points of irregular shapes; sometimes in clusters, now smaller, now larger; sometimes in small abrasions with ragged edges. These
proceed

* Vide History of the Disease in the Human Subject.

proceed towards the pylorus, beyond which they have seldom, if ever, been traced. Where this has not been detected, the stomach has appeared redder than usual in health, proving an increased quantity of blood in the vessels and its coats^e. Yet this is far different from that kind of inflammation which has properly been called active. Here it is of the erysepe-latous kind, and is always accompanied with marked debility of the system.

Dr. Ferriar in a late inspection has evidently proved the existence of these abrasions; and from the short distance between death and his examination, we may rely on these appearances as absolutely belonging to the disease, and not to changes from putrefaction after the extinction of life^f.

Who can with propriety consider a disease in the light of highly inflammatory, where there are faintings on the smallest motion, inability to bear an upright posture, extreme sensibility to cold air, convulsive agitations, dilatation of the pupil, &c. &c? It is for this

G 3 reason

^e Vide Webster on Connection of Life with the Stomach.

^f Zwingerus found the "intestines but especially the stomach, to be distinguished with red spots." Vide Morgagni, epist. 8. § 20. Others have found the same.

reason the use of the lancet is now prohibited, which before the investigation of the nature of these symptoms, and while it was considered as inflammatory, was largely exercised. Not an instance, however, is to be found of a buffy crust on the surface of the blood. There is, indeed, an example which, at first view, would seem contradictory to the idea of debility. This is an instance of a patient running with swiftness round Smithfield, a few minutes only before death; the distance is near a quarter of a mile^s, the exertion affording him only momentary relief. A second instance may be found in Morgagni, where a boy in the paroxysm dragged his father, who held him by the hand to restrain him, round the city of Bologna, a little before his death^h. But this can no more be considered as a proof of existing strength, in the common acceptation of the word, than a paroxysm of high delirium in fever, followed immediately by a proportionate collapse and death.

If it be admitted that there is a strong similitude between Hydrophobia and Tetanus, and
some

^s Vide Transactions of a Society for the Improvement of Surgical and Medical Knowledge.

^h Vide Epist. 8. § 22.

some similitude there certainly is, this must destroy every idea of an inflammatory diathesis, as the essential mark of tetanus is debility; and that it never arises but from previous weakness, or from great irritation on the nervous system, is indisputably allowed.

With respect to the analogy which has been maintained between the two diseases, perhaps it may have been carried too far. This would appear, from the assertion, that in warm climates the occurrence of both is most frequent. Observation has not yet, I apprehend, fully established this fact. Tetanus is indeed, endemial to warm climates; true and genuine tetanus arising from internal causes, exposure to sudden alternations of heat and cold, of damp evening dews, and piercing mid-day suns, of hard labour under the latter, and inactivity or the dangerous repose of sleep under the former. Another case of tetanus must be allowed as arising accidentally in any climate; the case of excited irritation from extraneous bodies, from wounded tendons, &c. This last is rare when compared to the other. Warm climates and seasons are not at all essential to the propagation of Hydrophobia, at least the disease is far from being thus circumscribed;

cumscribed; its remote causes extend to climates of an opposite nature, to seasons the most rigorous; or it appears alike in the more temperate and mild. Every man's experience is a proof of this. Who has not, in some part of his life, been disturbed by the alarm of rabid dogs in the midst of winter or depth of snow! But this is not the place to discuss the question of remote cause.

The diseases differ also in another essential characteristic; Hydrophobia arises from infection; for the most part from the infection of a rabid animal. This is the most common; yet I do not assert, unequivocally, that it is the only case. It constitutes, however, a dissimilitude between them tending greatly to weaken, though it may not totally destroy, the analogy. The symptoms, it is confessed, are very similar; irritability and other marks of great nervous affection; but diseases must not be classed by their symptoms only. This is a defect in nosology; their seats and causes, when known, should not be omitted.

Other arguments have been advanced to establish the analogy; the history, for instance, related by Morgagni, of a bite from an enraged, not rabid cat, inducing a tetanic disorder resembling

sembling almost perfectly genuine Hydrophobia. The same appearances have followed from mental impressions, such as terror suddenly excited on observing a person suffering under the agonies of this malady; while they have served at the same time, according to them, as sufficient proofs, that without absorption, in cases even of rabid infection, Hydrophobia may commence and run its fatal course. The only inference, with safety, to be drawn from this analogy is, that tetanus, hysteria, violent spasms from sudden mental impressions, and some other diseases, of which Hydrophobia is one, are marked with difficult deglutition, and a few other symptoms in common. But this resemblance holds no farther; it deserts us in the investigation of the cause; and it has hitherto deserted us in the application of the cure.

We have seen an affection of the stomach and œsophagus in rabid Hydrophobia; we shall find a copious secretion of viscid saliva, a constant concomitant, extremely troublesome, and creating to the sufferer one of his greatest inconveniences, often ejecting it with a force, and with a rapidity astonishing to the by-stander. What have we in tetanus strictly analogous to this? Can the trifling
salival

salival increase in trismus bear comparison, which seems to be little more than a dripping of the natural discharge from the corners of the mouth, in consequence of the tongue being prevented, under this state of rigidity of muscles, and fixed position of the under jaw, from collecting it as usual? With equal propriety might we pronounce cynanche tonsillaris (common quincy), strictly allied, because there is an increase of saliva from the inflammatory activity of the parts diseased communicating with the salival glands. Yet who would call forth such an analogy to establish a similitude with Hydrophobia? In a word, striking differences may be found between these two diseases sufficient to weaken that intimate analogy which some authors wish to establish, and at the same time to impress the mind with conviction, that something more than local irritation takes place in Hydrophobia; that a specific virus is introduced into the habit, and that nothing short of this can so satisfactorily account for the scene we observe from the first appearance of the rabid action till death.

We must, however, coincide with Dr. Mease in concluding, “ that the virus induces a general debility of the nerves, and deprives them

them of their healthy tone and customary energy which they had over the whole body ;” but we would coincide on principles altogether different, namely, that it takes place *secondarily*, not *primarily*, or in other words, is produced through the medium of absorption.

Might not hysteria, or epilepsy, and tetanus, be considered as more strictly allied than Hydrophobia ? These diseases, in as far as convulsive motions form a similitude, have much resemblance ; but examine their causes, examine also the appearances on dissection, especially in Hydrophobia ; here they materially differ. Do we find in the two former disorders marks of ventricular erosions as a most common occurrence ? Have we not reason, from the different dissections made by different men, but especially from Dr. Ferriar’s, to believe that in Hydrophobia they are constant and essential to the malady ? In the idea that the seat of the disease is in these parts, I am supported by Dr. Darwin’s opinion, though it was my own years before I read his instructive works. He speaks of an affection about the cardia, propagated by association from a more distant part ; but omits the abrasions
and

and local injuries of the stomach. This noble and necessary part of our machine, the stomach, being so disordered, it is not surprising that convulsions should follow. May we not attribute to its affections, and those of the œsophagus near the cardia, the greater share of that ropy discharge, already mentioned, and not solely consider it as arising from the salivary glands?

When tetanic affections succeed wounds, or splinters, or other extraneous bodies; or when they arise from internal causes, or alternations of heat and cold, &c. they generally appear at an early period after the injury. We cannot speak thus of Hydrophobia; it is not so indetermined in its period (I must repeat the assertion) as authors have attempted to establish. Who will affirm, after collating a sufficient number of casesⁱ, that the disease commences from one day after the bite to forty years and upwards? Credulity and imperfect observation have served to multiply histories of this kind, and the opinion is even at this day current with many. To most of the instances of early appearance, the name
Tetanus,

ⁱ Vide table of hydrophobic cases.

Tetanus, not Hydrophobia, ought to be applied. When we read of Hydrophobia from the beak of a cock, the claw of a cat, the bite of some enraged creature, as of a rat, of an enraged horse, or even of man, whether inflicted on his own person, such as biting off the joint of a finger^k, from a paroxysm of rage, or from disappointment in love, or from fear and other strong impressions of the mind, we may fairly conclude the affection was tetanus. On the other hand, when we peruse cases denominated hydrophobic, arising at the distance of forty years from their alledged cause, we need not hesitate to pronounce them either spontaneous from impressions of the mind, or from injuries recently received; or, if they were hydrophobic from rabies, a recent cause also, but forgotten or overlooked from the flightiness of contact and injury at the time, doubtless gave them birth.

The distance from the cause in Hydrophobia to the appearance of the effects, is very far from indefinite; nor ought it to be considered in this light more than other specific diseases, that vary in the period of their commencement

^k Vide Hist. et Mem. de la Société Roy. de Medicine, Année 1783, part. 2.

ment according to the nature of the poison, the constitution, &c. as we have instanced already. In the former, we consider the weaker nature of the poison, or some other property it may possess, as a fact established, requiring a considerable period to induce the complaint; in the other specific poisons, their stronger quality, or some other property peculiar also, rendering them more active, enables them in a shorter space to do the same.

There is another disease, which by some has of late been considered as infectious, and the infection likewise of a weak kind. In this light even Dr. Rush, views consumption of the lungs. He is confirmed in this opinion by his observations. From these he infers, that the time of excitement is distant from the time of the reception of the poison, from two to three months; nay, in one case, the Doctor says, he observed the consumptive contagion to lie inactive till near a year after it was received. Here is a latitude equally great with the hydrophobic poison; and if in one instance of infection this be admitted, where is the difficulty of admitting it in a second? From the bite of the rattle-snake, to the bite of a rabid animal, we might form
a scale,

a scale, a regular gradation where the former begins, and the latter finishes it, of specific animal poisons having their effects excited after their reception all at different intermediate spaces, and all varying with respect to themselves in the time of excitement, according to the habit on which their action is exerted.

In the consumptive poison, the lungs are its specific seat, the part on which it exerts itself; in the hydrophobic, the œsophagus and stomach seem to be the principal scene of its activity. If the Doctor admits absorption in the former instance, he will not, we may presume, refuse it in the latter.

To account for the infrequency of Hydrophobia, compared to the number bitten, Dr. Percival has recourse to an ingenious supposition, that “this poison seems to exert its energy *only on certain nerves under certain circumstances.*” When this condition is not present, the injected poison, consequently, is inert. Is it not somewhat strange that this condition should be so often present in quadrupeds, that scarcely a dog, a cow, horse, or hog bitten, escape; while, on the other hand, not more than one in about sixteen, among the human species

species exposed to the venom, become hydrophobic? Constitution, doubtless, and the peculiarities in the form of different species of animals, will reach this question to a certain length; but the different coverings, the thickness of garment worn by man, closely surrounding his body, his upper and lower extremities, hands, face, and part of the neck excepted, afford him a protection nearly sufficient for the explanation in a more obvious way.

Though the teeth may penetrate through the clothes, and a wound be given, yet they are wiped and cleaned, in some measure, from the adhering poison. This is not meant, however, to deny the escape from the disease in several instances where the naked surface has been exposed to the bite; but to account for this, another supposition may be offered, not farther removed from probability, that the state of the poison itself may be at one time more, and at another period of the dog's illness less virulent; just as we have formerly proved to be the case with respect to rattlesnake and viper; nay, perhaps, with the variolous poison likewise.

With respect to absorption; the phenomena of the approaching disease argues strongly for
its

its existence. Marks of re-appearing inflammation round the cicatrix with pains from thence stretching towards the head, &c.

From the case of Race¹ signs of absorption seem indicated. The same is indicated in Knipe's case^m. This patient was bitten in the hand; he felt a pain stretching from the wound to the shoulder as harbingers of the approaching affection. We need only consult the cases annexed to be convinced, that these are far from solitary and insulated examples of the same.

Pains of this nature round the wound, and stretching towards the head, heart, and body, afford strong presumption of absorption, though neither inflammation nor tumefaction can be discovered in the axilla. One case is narrated, where along with these, the whole arm, from the wound upwards, became discoloured on the approach of the disease.

Little doubt can remain from what has been advanced, if all the phænomena be carefully weighed, relative to absorption; and as little respecting the *locality* of the poison where it was first inserted, till the time of these appearances; or till the time peculiar to the virus, and necessary for this operation be complete.

H

plete.

¹ Vide Appendix.

^m Ibid.

plete. It may be superfluous now to recal the reader's attention to the instance of double absorption, as a farther corroboration of the different periods required by different poisons to give them activity. But to remove all uncertainty of the intervening process of absorption, there are facts appearing directly to the point; and however credulity itself may startle at several things advanced, not only by ancient, but even by modern writers on Hydrophobia, yet in these instances related without any view to hypothesis, we cannot hesitate, I think, to give them credit.

The first of this nature which we shall adduce arose from contact only of rabid saliva, and without any injury done to the personⁿ. According to the relater of this case, the disease took place on the eighth day following, and on the third day after this the patient died. This case is not the most favourable indeed in all its parts to establish the point, but others have relied on it, and I shall therefore here take it in the same acceptance. The disease unquestionably arose much earlier, than we find in the generality of instances. From this we might be led to
doubt

ⁿ Vide Ephem. N. C. ann. 7. obs. 121.

doubt whether it really sprung from this source. Fear might operate on the patient's mind from so near a contact with a rabid animal, and tetanus and death succeed.

The second I shall mention is likewise unfavourable to the doctrine attempted to be established, which respects a distant period from insertion. It is the case related by Cœlius Aurelianus°. Another doubt remains on the face of it, the doubt of inaccuracy, as he did not see the patient, but produces the history on the veracity and fidelity of a friend. He asserts the death of a female patient, *three days* only after the application of her lips to a seam in her garment, which she was mending, and which a mad dog immediately before had torn in leaping on her as he passed, but without doing her any other injury. In laying the seam smooth, in this manner, she received the moist saliva of the dog, on her lips and gums, the absorption of which induced the malady. That it should arise at so short a period is with me the stumbling block: with ingenious Physicians who hold its production from one day upwards, to a very distant time, it will be

H 2

none.

° Vide De morb. acut. lib. 3. cap. 9.

none^p. If this case be authentic, according to my position, the disease was tetanus, induced by fear from the near connection with the mad animal, and absorption had but a doubtful share in its production. If we allow absorption, then we may suspect the word *day* to have been inserted by mistake for *week*. Three weeks is a period at which true rabid cases have appeared. I have brought these two cases forward, though less favourable, in its full latitude, to the opinion here advanced, because they are both said to have happened without abrasion of cuticle; and consequently, it is to be presumed, through the absorption of the virus by which it was besmeared.

The third example is more satisfactory; in the distance of excitement from the application of the cause, it accords more with many well ascertained instances; for Hydrophobia did not take place till (*post multos dies*), many days had intervened. The author of this relation is Johan. Mathæus. He affirms that Hydrophobia arose only from the introduction of

^p The canine virus "has been known to infect in all the intermediate periods, between the *first day* of a bite, and nineteen months afterwards." Vide Mease's Essay on the Bite of a Mad Dog, page 68.

of the hand into the mouth of a mad dog, without the slightest wound being received. The patient's name was Johan. Coqueranus^q.

The fourth authority we shall cite is that of Matthiolus. He adduces two instances, from his own observations, where the disease arose from the contact with saliva, and also without the infliction of a wound; and he seems offended with the incredulity of those who doubt the possibility of such a fact.

The fifth is that of Hildanus. In a letter to his friend Dr. Abel Roscius of Laufanne, he relates a similar example, and pledges his veracity for its truth. The subject of the case was a woman whose gown was torn by a mad dog (she did not at that time know the dog was rabid) but from which she received no injury. In sewing up the rent she bit off the thread, the part being as yet wet with the dog's saliva, and in three months after the disease seized her and she died^r.

A sixth authority is from Cardan. The instance he relates of Hydrophobia by contact merely with saliva, is that of a person who requested to kiss his mad dog before it was

H 3 drowned.

^q Vide Joh. Mathæi Consul. N^o 82.

^r Vide cent. 1. obs. 86.

drowned. He received no bite, yet afterwards fell a victim to the disease. Cardan was called in consultation; he predicted his death (no very difficult task), which took place on the following day.

The seventh is Dr. Bardsley. He adduces an instance on the authority of Dr. Percival, equally to the point. A man living at Worrall in Cheshire, having fell asleep on the ground, and while he was in this situation, a mad dog accidentally came past, licked him about the mouth, then ran away without doing him further injury. He was seized with the disease about the usual time, and died in consequence.

The eighth authority is from the Swedish transactions^s. The instance alluded to, is that of a lad who had been in the habit of sleeping with a lap dog. This creature had contracted the disease, and was then under its influence, though undiscovered both by the family and the boy. It died rabid the following day from the discovery. As the disease continues in this animal, from its accession to its termination, in general about seven days, we may conclude, that the boy must have

^s Vide ann. 1777.

have received the infection from his dangerous bed-mate, several days before its death. The dog's death happened on the 12th of June; the first intimation of Hydrophobia in the boy appeared on the 24th, but it was six days from this till death. The horror of liquids manifested itself only twenty-four hours before. No bite had been received from the animal, but, as had been his custom, he carried and handled it. There can be little doubt, likewise, of his having kissed it, and through this channel received the virus; for the lad "complained to other people of its *stinking* breath."

The ninth we quote from M. de la Pryme. It is precisely to the same effect; there was no bite here. The fingers only were introduced into a whelp's mouth, for the purpose of examining its tongue, and discovering the cause of its not swallowing readily. It died rabid soon after, as had the mother and the rest of her litter just before, and as afterwards did the unhappy youth alluded to^t.

The tenth, which shall close this catalogue, is that which I have related formerly^u. This

H 4 instance,

^t Vide Philosophical Transactions, N^o 277.

^u Vide Remarks on Hydrophobia, &c. 1785.

instance, indeed, labours under the same suspicion with that of Cœlius Aurelianus, wants my ocular testimony, and like his too, is introduced on the veracity of a friend, but who insisted on its being fact. His death since prevents me from bringing him forward in his own name. He was a man of letters, however, and guarded in his assertions ; in giving full confidence to his relation, no suspicion whatever need be entertained, I may venture to affirm, of misrepresentation. Easy credulity in a man of letters, and a philosopher, would, indeed, be a blemish. This instance has likewise a great similarity both to that given by Cœlius Aurelianus and Hildanus, and by some might even be mistaken for a transcript of the one, or the other. Notwithstanding this I am persuaded of the fact.

A young woman had her apron torn, and flavered by a mad dog leaping on her and attempting to bite. Fortunately she received no other injury from him, by the timely assistance offered, and by the loose part of her cloathing which he laid hold of. But imprudently, and without proper reflection, she began to mend the rent in her apron before the part was either washed or well dried ; and

as imprudently, or through habit, instead of cutting the thread with scissars, bit it off with her teeth. Lo, what followed! In a few weeks she was seized with Hydrophobia, which proved fatal.

In every instance here collected, no wound was given; no injury received; the saliva alone, or more properly, part of that discharge issuing from the fauces, œsophagus, &c. together with the breath, in a few of the examples, besmeared some external part only of the cuticle or thinner epithelion. [The fingers and hands, the lips and gums, where the pores are more than usually patulent, had the virus applied to them. That the absorbents laid hold of it and carried it from thence, just as in the cases of air thrown under the skin into the cellular texture, and the gases applied externally by Abernethy, cannot, I apprehend, admit of a doubt, and would seem to establish incontrovertibly the opinion of absorption.

Leaving the opinions of *local irritation*, and *absorption*, to be further discussed by such pathologists, as may conceive the arguments here adduced inconclusive on either side, we shall proceed, without further delay, to consider the question formerly proposed^w, viz.

In

^w Vide page 32.

In what manner is the practitioner to conduct himself, in order to obviate the impending danger, from rabid virus, either inserted in a wound by the animal's tusks, or besmeared over some naked part of the body, thinly and delicately covered with cuticle? Whatever may be the issue of the opinions respecting *primary irritation*, and *absorption*, according to the doctrine attempted here to be established, the method proper to be pursued will be precisely the same. We enter, therefore, on it with more confidence, and without much apprehension of contradiction, as to general principles, though the particular mode of execution may admit of some dispute. But first it may be requisite to examine somewhat more intimately into the assertions of respectable writers, relative to the early commencement of the disease, which, from the following view, it will be evident, can scarcely be admitted as facts.

THE OPINION TO BE REJECTED OF ITS COMMENCEMENT FROM THE FIRST HOUR TILL YEARS AFTER THE BITE.

THIS opinion held by some eminent characters, both ancient and modern^a, being dissonant to the laws of other poisons, cannot, consistent with the view I have attempted to give, on the authority of many cases, be received here as a fact. That diseases have commenced soon after the infliction of a wound from animals of various classes, both rabid and enraged, cannot be contested. Such instances appear to be related with fidelity as the facts presented, or were given on good authority from the observations of others. These diseases however, seem clearly to have their origin from a different source; they arose from tetanus, the consequence of irritation.

When I read of hydrophobic cases springing from the bites of cocks and other domestic fowls, of horses, cows, apes, swine, &c. as
before

^a "For some people" says Boerhaave, "are *immediately* seized with the symptoms of this disease; others not till twenty years after, &c."

Vide aphor. 1137.

before mentioned, if they are to be credited, it is to this species of disease we are to refer them. Though affections of this nature commence soon after the application of their cause, yet neither my own, nor the experience of those with whom I have had medical communication, can produce an instance of an attack so early as the first hour. Books, however, furnish such assertions; and they are applied also to Hydrophobia, which, if my conjectures be right, are still more improbable. Tetanic affections seldom arise sooner than twenty-four or thirty hours after the application of their existing causes. They have appeared after three days, they have been protracted to six, but I know not whether as a general law they have often been protracted beyond ten days, or commenced earlier after the applied cause, than six hours. With respect to the three following instances; the first appeared a *few days* after the application of the cause; the second at the distance of seven, being occasioned by the extraction of a tooth, and even this not till after exposure to cold; and the third from a puncture with a rusty nail in the foot, on the ninth day. Allowing the puncture to be the cause in this example,

example, it is among the latest perhaps of appearance; but there is sufficient grounds for its excitement, in the very severe labour the patient sustained in the exercise of his business on the timber raft where he was taken ill, which, if granted, will limit it to the preceding day only. The excessive heat, the fatigue and labor, his wet clothes, joined to the dampness of the night air on the water after copious perspiration, are of themselves adequate.

Dr. Gloster's patient was seized *twenty-four hours* from the time of sleeping on the damp ground; this was after great fatigue and heat.

The maid servant attended by Dr. Rush became affected *next day* from sleeping on a damp brick pavement, after great heat of the weather^b.

Leslie, another patient of Dr. Rush, who ran a nail into his foot, was attacked *next day* with tetanic spasms^c.

A patient under my care having used a shower bath about six in the morning (July 1793), was attacked about four in the *afternoon* of the same day with excruciating tetanic spasms in the face, distorting the eye-balls and countenance.

A patient

^b Vide American Transactions, vol. 1. page 379.

^c Ibid. vol. 2. page 225.

A patient in this place with a compound fracture of the limb, on the *third day* after the accident, was seized with tetanus which proved fatal. Besides these, the following cases are additional proofs.

First, locked jaw from a wound. In this case the disease began to appear on the day after the granulations in the part lost their florid colour and became sanious. I date the application of the irritating cause from this time^d.

Second, another case of trismus. Here it came on in a *few days* after the application of the irritating cause^e.

Third, a negroe boy was sun-struck. *Very soon* after, on the same day, he was seized with locked jaw, and other tetanic spasms^f.

Fourth, a second negroe boy received a severe beating about the temples with a stick; and in *a few hours* after symptoms of trismus appeared^g.

Fifth, a third negroe after severe labour in hot weather was seized with the same disease *very suddenly*^h.

Sixth, a fourth negroe having received a wound in the sole of his foot was attacked with

^d Vide London Medical Essays, vol. 3.

^e Ibid. vol. 4. ^f Ibid. vol. 6. ^g Ibid. ^h Ibid.

with tetanus and locked jaw on the *third day* after.ⁱ

Seventh, a fifth negro (a female) from sleeping in the open air, exposed to the cold, was seized *soon* after with the same disorder. By what follows in the history of her case, it is evident she became affected in the course of the succeeding day.^k

Eighth, in another case the time from the application of the cause to the commencement of the disease is not so distinctly marked. It arose from lodging in a bad hut, in a damp and low situation during foggy weather: but it may be easily conceived, that it was not long after exposure to so powerful an agent in the production of this malady.^l

Ninth, it was the *fourth day* from the bite of the enraged cat mentioned by Morgagni, when tetanus (for it was not Hydrophobia) commenced.

Tetanic affections arising from such causes, keep no regular time; yet they are never at any great distance from the application of their cause.

In some cases which authors term hydrophobic, but which I would refer to this head, the
patient

ⁱ Vid. Lond. Med. Essays, vol. 6.

^k Ibid,

^l Ibid,

patient has been seized about the *third day*. Cœlius Aurclianus gives one commencing at the third day.^m

Now, from the authentic histories of Hydrophobia really arising from rabid infection, I believe not a single instance can be produced *so soon*, much less *previous* to the tenth day. From these considerations, and from a review of the cases instanced in the following table, not to mention many others that could be adduced, I must absolutely and totally reject the idea of Hydrophobia from rabid virus taking place, not only from *one hour*, but also “in all the intermediate periods, from one day after the bite, till eighteen months;”ⁿ or in other words, I contend, that it seldom, if ever, commences before the nineteenth day, or after the eighteenth month.

In all my researches, I can find but a small comparative number commencing earlier than the eighteenth day. There are indeed a few cases

^m It is that already quoted as an example of absorption without a wound, but which, from this circumstance, was given as a somewhat doubtful case, from so great a deviation in respect to the general law of Hydrophobia. If there be no error in the date, I apply it as an instance in this and reject it as an example of the other.

ⁿ Vid. Mease on the Bite of a Mad Dog, 1783.

cases given as authentic of an earlier appearance ; but I would consider them rather as deviations from a general law, and exceptions serving only to establish more firmly a general rule. These are George Cobb, a boy, who we are informed took the disease on the eleventh day ;^o another boy, at Colne, in Essex, who became affected on the twelfth day from the bite ; and a case of which an account is given in the Memoirs of the Royal Medical Society at Paris for 1783, part 2.

From the 18th to the 30th day, the numbers truly are comparatively few ; for out of 131, only 17 took the disease sooner than the 30th day. The number of the next class is great, consisting of no fewer than 63 from the 30th to the 59th day inclusive.^p The next class diminishes ; for we have only 23 from 2 to 3 months inclusive ; nine from 3 to 4 months inclusive,^q two of 5 months, one 5 months and 11 days, one 6 months, one 7 months, two of 8 months, one between 8 and 9 months, two of 9 months, one of 11 months, one of 14 months, two of 18 months, and one of 19
1 months,

^o Vid. Med. Facts, vol. 3.

^p No. 19 and 33, marked at *several weeks*, included here.

^q One of these, though classed here, uncertain as to time. Morgagni, relating the circumstance, only says "*some months*."

months, the longest to which any credit can be given.

It is apparent, that from the first month to the third inclusive after the bite, the disease shows itself in a decided majority; viz. in no less than 87 cases out of the whole. The next 3 months comprehend only 11 instances; the succeeding 6 months completing the year, only seven; and in the next and last period, including the 19th month, there are only four instances.

If we have considered these under 18 days as irregular and extraordinary, we may, in like manner, view those four, in the last division, as of the same nature. Nor do they disturb the general law proper to this disease more than cases of inoculated small-pox, commencing occasionally on the 7th day, tend to disturb the general law of that malady; yet extending, as is sometimes found, to the 10th, or even 14th;^r though at a medium the 9th may be considered as the time of febrile accession.^s A similar deviation is found in other complaints; this has been noticed already; and in the plague itself, the

^r An instance of this has already been given.

^s Authors have placed it at the 8th day; but in more than 1500 instances, under my own care, the majority fell on the 9th.

the commencement varies from six hours to four days, though the general time of attack lies between. But let the reader peruse the following table, and draw his own conclusions.

T A B L E.

SEX, AGE, AND DISTANCE FROM BITE.*

MALE ADULTS.

No.	Name, &c.	Age.	Distance.
1.	----- Bean - - -	69	26 days.
2.	----- Bellamy ^a - - -	40	4 months.
3.	John Slight - - -	23	60 days.
4.	A patient - - -	36	5 weeks.
5.	----- Race ^b - - -	40	6 weeks.
6.	Francis Tweed ^c - - -	55	20 days.
7.	A farmer - - -	25	9 months.
8.	James Corton ^d - - -	-	6 weeks.
9.	A patient - - -	45	10 weeks.
10.	Thomas Hogge ^e - - -	33	27 days.
11.	Morgagni's patient ^f - - -	60	3 months.
12.	Ditto (a monk). - - -	-	2 months.

* Those cases to which there are no references, may be found chiefly in different periodical publications, in the hands of every English medical reader.

^a Fothergill's Works. ^b Vid. App. ^c Ibid.

^d Philos. Transf. ^e Med. Comment. D. 2, vol. 10,

^f Vid. Morgagni, Epist. 8.

No.	Name, &c.	Age.	Distance.
13.	John Edwards ^g	40	8 months.
14.	Blaife's 1st patient ^h	-	1 month.
15.	Ditto second	-	6 weeks.
16.	Ditto third	-	74 days.
17.	A gardener	-	4 months.
18.	Howman's patient ⁱ	-	6 weeks.
19.	Pey Dumenia	-	<i>several</i> wks.
20.	Gardener's fervant	-	4 months.
21.	Mead's 2nd patient	45	66 days.
22.	Munckley's patient ^k	36	39 days.
23.	Vaughan's 2nd patient	25	9 months.
24.	Hildanus's 1st patient ^l	-	3 months.
25.	Ditto second	-	3 months.
26.	Ditto third	-	7 months.
27.	Hammond's patient	-	6 weeks.
28.	William Bland ^m	-	4 months.
29.	A patient ⁿ	-	4 months.
30.	William Knipe ^o	-	11 months.

^g Gentleman's Mag.

^h Vid. Mem. de la Soc. Roy. de Med. ann. 1783, p. 53.

ⁱ Philos. Transf. Lond. ^k Med. Transf.

^l Uncertain of age and sex in these three, the work not being at hand.

^m James on Canine Madnefs.

ⁿ Vid. Mem. de la Soc. &c. This is the only one of nine bitten by the same mad wolf, who took the disease.

^o Med. Comment.

No.	Name, &c.	Age.	Distance.
31.	Choisel's patient ^p	-	33 days.
32.	Mr. Dawfan	-	6 weeks.
33.	----- Criques	-	<i>several wks.</i>
34.	A patient ^q	-	<i>some months.</i>
35.	Ditto ^r	-	1 month.
36.	Dundas's patient ^s	-	18 months.
37.	A gardener ^t	-	55 days.
38.	A patient ^u	-	52 days.
39.	----- Boyer ^v	25	74 days.
40.	A patient ^w	-	4 months.
41.	Ditto ^x	-	8 or 9 months
42.	Ditto	-	5 months.
43.	Ditto ^y	-	5 mon. 11 days.
44.	John Johnston ^z	-	3 months.

^p James on Canine Madness.

^q This patient was suddenly plunged into water, and held there some time. He died next day. Vid. Morgagni, Epist. 8. § 22.

^r Plunged also into water, and died immediately on being taken out. Ibid. § 25.

^s They supposed the dog mad: he was shot instantly. To me the disease appears the product of terror from apprehension of this malady, and agitation of the mind arising from the fear of imprisonment for debt.

^t Mr. Sabatier's patient. ^u Ditto.

^v Vid. Lond. Med. Journ. vol. 5, App.

^w Mentioned by Dr. Houlston.

^x Bitten by a cat. Wiesel Obs. Rar. Cent. 1. No. 100. p. 400.

^y Van Swieten Comment. ^z Med. Facts, vol. 1, p. 1.

No.	Name, &c,	Age.	Distance.
45.	Jeremiah Groves ^a	-	96 days.
46.	A patient ^b	35	1 month.
47.	Ditto ^c	-	1 month.
48.	Ditto ^d	30	1 month.
49.	Ditto ^e	46	3 months.
50.	Louis Michaut ^f	-	3 months.
51.	Sieur Gravan ^g	72	38 days.
52.	Jean Arbelot ^h	28	68 days.
53.	A patient ⁱ	-	58 days.
54.	Pierre Delplain ^k	-	30 days.
55.	----- Bosquet ^l	-	53 days.
56.	Jacques Maffelon ^m	-	25 days.
57.	A patient	60	3 months.
58.	Ditto	-	38 days.
59.	Ditto	-	44 days.
60.	A man cook ⁿ	30	40 days.
61.	A patient, an advocate ^o	32	6 months.
62.	Ditto, an ideot ^p	-	21 days.
63.	Ditto, a mason ^q	22	8 months.

^a Dr. Maclean's patient, Sudbury.

^b Bitten by a cat. Dr. White's 1st patient, St. Edmund's Bury.

^c A middle aged man. Dr. White 2nd patient.

^d Dr. White's 4th patient.

^e Vid. Mem. de la Soc. Roy. de Med. ann. 1783, page 46.

^f Ibid. page 110.

^g Ibid. p. 175.

^h Ibid. p. 31.

ⁱ Ibid. p. 52.

^k Ibid. p. 117.

^l Ibid.

^m Ibid. p. 122.

ⁿ Ibid. p. 222.

^o Ibid. p. 234.

^p Ibid. p. 289.

^q Ibid. p. 290.

No.	Name, &c.	Age.	Distance.
64.	A patient ^r	- -	18 months.
65.	G. Pollock	45 -	3 months.

Males under Twenty-one Years of Age.

66.	Mead's first patient	9 -	32 days.
67.	Ditto third	18 -	3 months.
68.	James Paton ^s	14 -	12 weeks.
69.	John Brown ^t	13 -	4 months.
70.	Blaise's 4th patient	- -	6 weeks.
71.	A student of physic ^u	17 -	1 month.
72.	Abraham Palmer ^v	14 -	38 days.
73.	C. Bullock	4 -	37 days.
74.	Samuel Smith	18 -	45 days.
75.	Dr. Gray's patient ^w	12 -	24 days.
76.	Vaughan's 1st patient	14 -	1 month.
77.	Ditto third	8 -	ditto.
78.	Master Rowley ^x	11 -	36 days.
79.	Indian boy	14 -	30 days.
80.	A patient ^y	- -	18 days.
81.	Berkenhout's patient	- -	6 weeks.

^r Vid. Van Swieten Comment. on Boer. Aphor. 1137.

^s Med. Comment. vol. 3, p. 290.

^t Lond. Med. Obs. vol. 3, p. 356.

^u Med. Essay, Edinb. vol. 5, part 2, p. 590.

^v Lond. Med. Comm. ^w Med. Comm. ^x Vid. App.

^y Swedish Transl. for 1777.

No.	Name, &c.	Age.	Distance.
82.	Nourse's ditto ^z	-	19 months.
83.	George Cobb ^a	-	11 days.
84.	----- Jones	7	1 month.
85.	A patient ^b	12	12 days.
86.	Ditto ^c	12	40 days.
87.	Ditto ^d	-	5 months.
88.	William Bickerstaffe	14	25 days.
89.	----- Macy	5	20 days.
90.	A child ^e	-	1 month.
91.	Ditto ^f	-	ditto.
92.	Ditto ^g	-	ditto.
93.	A patient ^h	14	26 days.
94.	Elzeard Roche ⁱ	15	46 days.
95.	A patient ^k	12	40 days.

^z Philof. Trans. This is the longest on record.

^a Weeks's patient. Med. Facts, vol. 3.

^b Mr. Rainbird's, at Colne.

^c Morgagni, Epist. 8 § 22. ^d Ibid.

^e Lond. Med. Journ. vol. 10, p. 293. ^f Ibid.

^g Ibid. These patients were three of eleven persons bitten by the same dog, eight of whom escaped, and their preservation is said to be owing to the exhibition of the Tanjore pill.

^h Dr. White's, of St. Edmund's Bury, third patient.

ⁱ Vid. Mem. de la Soc. Roy. de Med. ann. 1783. part 2, page 32.

^k Ibid. page 55. This is not the exact time; for it cannot be found out to a day. The author only says, "From fifteen to twenty people were bitten by a mad wolf, about the suburbs of the city of Thiers, in the month of Feb. 1764; on the 20th of March he arrived there from Paris, and hear-

No.	Name, &c.	Age.	Distance.
96.	Gervais Briquet ^l	12	58 days.
97.	Jean Petit ^m	5	52 days.
98.	----- Castinel ⁿ	6	60 days.
99.	A mafon ^o	16	52 days.
100.	A patient ^p	5	14 months.
101.	Ditto ^q	14	1 month.
102.	Ditto	8	ditto.
103.	Ditto	3	25 days.

FEMALE ADULTS.

104.	Mary Strong	43	2 months.
105.	A patient at Edinburgh ^r	74	72 days.
106.	A French woman ^s	-	3 months.
107.	Maiden lady at Modena ^t	-	50 days.
108.	A maid fervanta ^u	-	6 weeks.

ing of the accident, was desirous of waiting the event, as he had never seen a case of Hydrophobia." About seven or eight days, he tells us, after his arrival, this patient took the disease, and died about 24 hours after difficult deglutition commenced. In two days more, the female mentioned at No. 110, took the disease, and died in thirty hours. If we suppose the accident to have happened about the middle of February, and to this add 28 days of the month of March, the time this patient was ill, it gives 42 days. In our table we have marked it at 40, which cannot be far from the truth.

^l Vid. Mem. de la Soc. &c. page 155. ^m Ibid. p. 29.

ⁿ Ibid. p. 225. ^o Ibid. p. 242. ^p Ibid. p. 282.

^q Ibid. p. 298. ^r Med. Com. D. 2, vol. 7, p. 546.

^s Vid. App. ^t Morgagni, Epist. 8. ^u Bitten by a cat.

No.	Name. &c.	Age.	Distance.
109.	M. A. Proghammerin	26	- 60 days.
110.	A patient ^v	26	- 40 days.
111.	Catherine Champion ^w	55	- 30 days.
112.	The widow Perronet ^x	-	- 52 days.
113.	Edmée Thibaudat ^y	-	- 57 days.
114.	Frances Etheveniot ^z	37	- 44 days.

Females under Twenty-one Years of Age.

115.	----- Niece ^a	- 7	- 19 days.
116.	----- Christy ^b	- 11	- 6 weeks.
117.	A patient	- 3	- 22 days.
118.	Ditto ^c	- 8	- 40 days.
119.	Ditto ^d	- 12	- 55 days.
120.	Ditto ^e	- 9	- 3 weeks.
121.	Ditto ^f	- 10	- 4 or 5 wks.

^v Vid. Mem. de la Soc. &c. page 55. ^w Ibid. p. 139.

^x Vid. Mem. de la Soc. Roy. de Med. p. 117.

^y Ibid. ^z Ibid. p. 30. by a cat.

^a Med. Transf. Coll. Phy. Philadelp. ^b Vid. App.

^c This happened at Glasgow, in the year 1792. Vid. Med. Comment. D. 2, vol. 7, p. 543.

^d Vid. Lond. Med. Journ. vol. 5, App.

^e Mr. Godfrey's, Coggeshall. ^f Ditto.

Neither

Neither Age nor Sex are mentioned of the following ten Patients who died of the Disease, out of Seventeen bitten by the same mad Wolf.^g

1.	-	15 days.	6.	-	33 days.
2.	-	18 days.	7.	-	35 days.
3.	-	19 days.	8.	-	44 days.
4.	-	24 days.	9.	-	52 days.
5.	-	30 days.	10.	-	68 days. ^h

From a careful review of these examples, the reader is enabled to estimate the value of many loose

^g Vid. Mem. de la Soc. &c. page 208.

^h I find from my researches into authors, the fatality from wolves to be much greater than that from dogs. In the present instance considerably more than half died hydrophobic. Is the famished condition of this animal connected with the frequency of his becoming hydrophobic? Is hunger in animals a frequent exciting cause? Is the cottage cur (oftener irregularly fed) more liable to Hydrophobia than the lady's lap dog?

As the distance here varies from the 15th to the 68th day, I regret the more this omission; I regret likewise, that the cases are not detailed at full length; that the variety of symptoms, and other concomitant circumstances, might be compared. Where so many died from the same animal something might be learned farther than we yet know, respecting the virulence of the infection; whether it lessens, as happens to the viper, in its strength, proportioned to the number wounded; whether also the young were attacked sooner than more advanced; whether, in females, it followed the same law; and lastly, whether from the wounds in the face and parts adjacent, the disease appear earlier than if more distant from the heart, as some have alledged.

loose observations, made not only by the ancients, but by several of the moderns on Hydrophobia. The ancients, in remarking on the distance from the bite to the commencement, were tolerably accurate, as are those moderns who have followed them. The period which Cælius Aurelianus, Galen, Paulus, and Actuarius, with Boerhaave and Van Swieten who followed their opinion, if not altogether exact, is but little short of the average when they stated it at forty days.

These cases will enable us also to discover, whether we are to rely on an observation of a modern writer, affirming that women and children are sooner seized than male adults. We do not find sex either retarding or accelerating the commencement of other specific diseases; neither has age any influence. The small-pox, the measles, or scarlatina, appear at their respective times, regardless of sex or age, due allowance being made for constitution.

Of eleven female hydrophobic adults, the youngest of whom is 26, none are seized with the complaint under a month. One takes the disease at a month, six remain free till nearly two months; two are seized at the completion of the second month; one between the second and third month; and the last not till the end of the third month. This disproves the obser-

vation:

vation: it is disproved still farther by the female hydrophobic children; for out of seven, the eldest of whom is only 12, three escape the disease till between 40 days and two months. In the class of boys its incongruity with nature is still more apparent; for no fewer than 22 out of 38 remain in health for one complete month; and three from two to three months. Nay, it is here we shall find the most distant attack expressed in the table. Besides this, we find a boy of 13 whose attack is protracted to four months; and a child under six years who remains free no less than 14 months. Of eight seized under a month, six are free from the 20th to the 26th day; one to the 18th; two only therefore, which complete the number, can be called very early. Lastly, when we advert to the male adults, where, if this observation be admitted, the protraction should be longest, we shall find eleven not exceeding one month; several of these between the twenty-first and twenty-ninth day; and one, 55 years of age, seized so early as the nineteenth day.

Another inference, happy in its consequences, may be deduced from this table; that should a person, bitten by a real mad dog, escape till the 19th month, it is only as one to a very large majority that he is not infected. Nay, I would venture

ture almost to affirm, as a general law, he has but little to fear after the sixth month; after twelve, perhaps next to nothing; and after the nineteenth, perfect security. To such as have been bitten, and passed this period, this doctrine is comfortable, and must relieve them from the dread of suspense; while the opinions hitherto taught, which respect an indefinite period, are fraught with an equal portion of lasting misery. I know an instance of such, and believe, that this person, for many years, has not had a single week unclouded, and without suspicion.

Should persons, even at the distance of eighteen or nineteen months, become subject to the disease, with me doubts would remain, whether it did not proceed from a second infection, or was induced *spontaneously*, as from fear, passions of the mind, and such like, which has been known to excite a complaint similar to rabid Hydrophobia, and distinguished by that name.

PREVENTION.

PREVENTION AFTER A BITE OR WOUND.

THIS is a matter, perhaps, of more importance, in the treatment of our subject, than any that can be brought under consideration; more even than the mode of introduction of the virus into the habit, and the adjustment of the difference of opinion arising on the two questions lately considered^t. For whether we embrace, in conformity with some of the ablest pathologists, the side of *irritation*; or adhere to the opinion of the introduction of the virus by the *lymphatics*, the modes of prevention will be equally consistent with each. In this both parties are perfectly agreed. Taking, therefore, this for granted, it remains for us only to examine the different methods recommended for this purpose, and appreciate, as far as we are able, their merits.

1st. *By suction.*

Some authors have recommended sucking the wounded part, and affirm that no danger can attend the person who performs this humane office, as the poison must be ejected with
the

^t Vide page 32.

the saliva by which the internal parts of the mouth are constantly bedewed, and which, as a further security, may be washed out afterwards with water^u. Examples are adduced in proof of the success of this method in the bites of other poisonous animals and reptiles, such as the viper, &c. But from the trials of Dr. Mead^w on the viper, it is evident, that on touching the tongue and lips with this reptile's poison, there is danger. This eminent physician and some other friends, in order to ascertain its nature, ventured to taste it diluted with water, and their tongues were instantly affected with a sharp burning heat. One, bolder than the rest, tasted it undiluted, and suffered for his temerity. The inflammation induced thereby did not subside for two days.

Suction did not succeed in saving the life of a celebrated queen of antiquity. “The unworthy

^u This doctrine was entertained by Celsus. “Homo,” says he, “adhibendus est, qui vulnus exfugat.” And he adds that experience confirms the practice. “Nam venenum serpentis, ut quædam etiam venatoria venena, quibus Galli præcipue utuntur, non gustu, sed in vulnere nocent.” But at the same time prudently cautions, lest there be an ulcer in the mouth. “Illud interea ante debet attendere, ne quod in gingivis, palatove, aliâve parte oris ulcus habeat.”

L. v. C. 27. p. 309. ed. Amstelædami, 1713.

^w Vide Mead's Works, vol. 1.

worthy Octavius, who wished to gratify his vanity by chaining Cleopatra to his triumphal car, vexed to see that haughty female escape from him by death, made one of the Pfylli (serpent eaters) suck the wound made by the asp that bit her." The attempt was fruitless; the poison prevailed; she was not restored. Here then is a strong example of the failure of suction.

If it fails in an instance such as this, where the viper's or other reptile's poison have been infused, is it reasonable to suppose that it will succeed better where the poison of a rabid animal is introduced? Granting even that a person could apply suction without danger, has it sufficient power to extract the inserted virus? In many cases the teeth penetrate deep, and in various directions, over which the superincumbent parts form valves preventing its return to the surface.

Berkenhout, however, affirms its efficacy. The instance he adduces proves nothing; for the animal was not mad which inflicted the wound, on one of his children, where suction was applied*. After the instances related, I cannot hesitate in pronouncing that the person
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who

* Vide Berkenhout on the Bite of a Mad Dog.

who performs this humane and well-intended office, performs it at his own risque; for some of the poison received on the lips from the surface of the wound, may adhere to them, or about the tongue and gums, and from the easy abrasion of their epithelion inoculation may follow; or it may be absorbed through the pores, as has already been shown.

2d. By Extirpation, Ablution, and Caustic.

If it be allowed that the doctrine of *absorption* be established, and also the *locality* of the poison for a certain time after the infliction of the wound, according to the law of this particular poison, an excellent practical rule follows; a rule that will enable us to prevent the occurrence of the malady at a period considerably later than its insertion. Nothing, however, but want of opportunity when the wound is given, ought to prevent the necessary precautions soon to be mentioned, for more effectually securing the patient's safety; yet, when this has been neglected, it will be a comfortable source of rational hope to look forward to an operation, at a distance from the accident, to avoid the risque of loss of life, which, from want of success in curing the disease,

disease, the patient must contemplate with horror as an unavoidable event.

Let us see what has been done in such cases; let us examine the facts which support this idea. First, Mr. Loftie had a patient who received the bite twenty hours before the part was extirpated, which is the operation under consideration. The disease did not take place.

Second, Of two cases related by Mr. Foot^y, excision was not performed in the one till near twenty-three hours, and in the other not till sixty-eight had elapsed. Both did well.

Third, It was thirty hours in the case mentioned by Doctor Shore^z, before any thing was done to the wound. The patient escaped.

Fourth, It was not till after twenty-eight days, from the bite, in the case of the young lady at Ipswich^a, when extirpation was performed. She is now, at the distance of three years, in perfect health.

Fifth, In spring 1792, and the preceding winter, the county of Suffolk was greatly infested with mad dogs, especially round Saint Edmund's Bury. Several accidents happened

K 2 from

^y Vide Foot on Hydrophobia.

^z Vide Mease's Essay on Bite of a Mad Dog, p. 125.

^a Vide page 23, note

from them to men and other animals. This afforded opportunities for excision at different distances from the bite. Some of them fell under the care of Doctor White of that place^b. In one case he cut out the part three days after the accident. The person has ever since remained well. Seven where bitten by rabid dogs about the same time in the neighbourhood. Three of them did not apply till the third day; two came to him on the second day; the other two not till *some time* (the period not specified) after the accident. The parts were then extirpated, and they all did well.

Sixth, A foal was treated in the same manner, bitten five days before. The animal continued well long after.

On the other hand, the same dog bit a horse, a cow, and two pigs on the same day; no excision was used; and though internal remedies were administered, the animals were all dead within the month; a presumptive proof of the superiority of extirpation.

Seventh,

^b The Doctor was not inattentive to the advantages that might result from this mode. Vide his observations on the subject, in an appendix to Mease's Essay on the Bite of a Mad Dog, London, 1793.

Seventh, I ordered two of my patients, Field and son^c, near this town, who had been bitten about forty hours, to submit to the extirpation of the wounded parts, which was done. At the same time I directed them to chain up the dog, to determine respecting his disorder. The dog died mad on the third day, after showing marks of a most violent disease by fits of the highest exacerbation, and fury, exerted against the chain that bound him, and the rails of the cage wherein he was confined. The men remain free from the disease at this day.

From these examples we may hope favourably even from late excision. But have we

K 3

reason

^c These are the two persons mentioned in my first edition. The cases were then too recent for a decided opinion as to the efficacy of the operation. Twelve years and upwards have elapsed, and I may now speak with positiveness.

This dog had left home a day or two before, and remained absent about two days; the family missed him but knew not the cause of his absence. Soon after his return he committed the accident. He not only ate and drank that day, but likewise after being chained. He appeared, on his return, as if fatigued and famished by abstinence and neglect, and knew the family as formerly; followed his master, who went to labour at his farm, and slept contiguous as usual, unsuspected of disease. It was on his master's walking abruptly up to him that he flew on, and bit him. The son was bitten afterwards, in another exacerbation; a farther proof of fits, and intervals in the malady.

reason to hope the same at the commencement of the disease; at the re-inflammation of the wound, the harbinger of this awful period? Is the poison latent in the part where first inserted till this time? From all parts of the evidence carefully weighed and taken together, I think, there is reason to conclude, that an operation, even at this late period, may be successful in preventing the approaching malady.

Let us again have recourse to the analogy of the small-pox. It does by no means appear in this complaint, that the system is infected till after the pustule, *locally* produced by the inserted matter, has suppurated. In the interim the person remains in accustomed health, I mean from the ingrafted disease. For in the interim, accidental catarrhal affections have arisen accompanied with fever. These have been removed by the common means, and health be re-established before any indications of the inoculated disease present themselves.

It may be objected to this illustration, that a disease seizing the habit while under the influence of another, has for a time suffered a suspension, till the latter has finished its process, when the former species of fever again
re-

re-commences, and continues its progress as at first; and that, therefore, this example is insufficient to prove the total freedom of the habit from the infection, till just at the commencement of the variolous fever. This objection will be removed by considering what follows.

We observe, that at the commencement of absorption, the inflammation of the inoculated arm spreads rapidly, and sometimes widely round, even in a very few hours; and in a very few more (it may be) symptoms of fever are discernable. Eyes dull; heaviness and languor; head-ach; nausea with vomiting; an acceleration of pulse, with dry tongue, and thirst, followed by the proper eruption. Tho' no experiments have hitherto been instituted so near the accession of fever, to place the subject beyond controversy, yet they are not wanting at an earlier period after inoculation.

It would, indeed, be a nice distinction to find the precise time that absorption begins, when the contents of the inoculated pustule first move, from their local situation in progress towards the heart; yet it is more than probable that excision, at this moment, would succeed; that the above symptoms, from the

commotion produced by them in the habit, point precisely when the virus, through the medium of the lymphatics, mixes with the mass. Applying this to our subject, the inference is, that excision ought not to be omitted at any period, from the infliction of the wound by the rabid animal, to the first symptoms of the approaching disease; and if done when the part bitten re-inflames and becomes painful, the hopes of prevention would be greater than if done a day or two later, when symptoms of the disease appear manifest. I am inclined to think even this a comfortable prop in a malady for which, I still assert, that no remedy has to this day been useful, no cure performed.

The following instance is calculated to corroborate this idea. Dr. Guthrie had a patient at Peterburgh, who was bitten by a dog. This was a boy, servant at that time to the British minister then resident at the Russian Court. This animal bit two other dogs on the same day, both of which died mad in the space of a month. This was evidence of the existence of the disease in the animal. The wound was in the foot. The Doctor scarified it till it bled freely. After this it was dressed

dressed with strong mercurial ointment for fourteen days ; and the fore was kept open by applying, occasionally, a small blister over the part.

Farther, the wound was dressed with Hill's Ormskirk medicine. By this means the fore was kept discharging for five weeks. It was then suffered to heal, and remained so for ten days, which comprehended a period of seven weeks from the accident. The boy then felt shooting pains in the cicatrix ; these lasted for several days, and one of the cicatrices began to inflame, and assume the appearance which the incision of inoculation presents before the eruption of the small-pox. The Doctor immediately ordered the wounds to be re-opened, and strong mercurial ointment again to be applied. During its use the shooting pains ceased, and the eruptive appearances subsided ; the boy remained well long after.

Though this case cannot be called a cure of Hydrophobia, that disease not being present, it may fairly be named a prevention ; for there were strong evidences of the disease being speedily about to commence. The treatment was doubtless highly judicious, and affords almost a positive proof of the utility of re-opening

opening the wound at its second inflammation. The mercury, in this instance, I would consider only as an escharotic. Not more than two drams were used. The conclusion from all we have said, and which, in a practical view, ought strongly to be inculcated, is, that excision ought to be performed as early after the bite as possible ; yet, should this have been neglected, or impracticable at the time, it ought not to be omitted at any period between this and Hydrophobia, from a supposition of its being too late.

If it be urged against the method, that it failed in the patient's case under Dr. Lister's care, the answer is, the disease was long begun before the operation commenced. The Doctor was not called in time. Two days sooner it might have had a different issue. The attempt was even then meritorious, and reflects credit on his judgment. He only scarified the wound, however, and applied a blister over the part. This mode, indeed, was not the best suited to the purpose.

The girl that was brought to the royal infirmary of Edinburgh in 1765, had her arm seared with a hot iron over the scar, immediately on being received into the house. It proved,

proved, indeed, ineffectual ; it was at too late a period. There had been symptoms of Hydrophobia for two days before. Some would have objected to the method, even if prosecuted earlier. The actual cautery carries with it much terror ; the scar made there^{it} will always remain unseemly ; neither can it be applied with conveniency, nor even safety, to several parts where bites may be received ; and the length of time consumed in the operation, and the consequent augmentation of pain, strongly militate against it, even allowing that the efficacy was equally powerful. The ancients, indeed, not only extolled, but practised it ; and some of the moderns of respectable reputation, have set it forth as having, over other means, great superiority^d.

In the following case its success seems to have been complete. This is related by a clergyman of character---“ I know,” says he, “ a quarter-master who had been bitten three times by mad dogs, and always cut out or *burnt* the part wounded. One time was early in the morning before people were stirring. Seeing a blacksmith’s shop open he ran in, and
snatching

^d Vide a Paper in the Memoirs of the Royal Medical Society at Paris for 1783.

snatching the red hot iron from the workman, thrust it into his leg, to the great surprise of the man, who thought him mad^c.”

We have already seen the great probability of being able to interrupt the progress of the variolous matter by excision, prior to the commencement of the eruptive fever; and a probability, equally strong, authorises a similar practice where wounds have been received from rabid animals. The analogy is strong; they are both inoculated poisons; and according to the reasons already advanced, reasons sufficiently powerful, in the opinion of several, both enter the system through the same channels.

Since the first edition of this work, we have to lament the death of four more of our fellow creatures in this neighbourhood^f, from this malady, and many in other parts of England. Scarcely a month, indeed, passes without reports of accidents of this kind. Excision was not performed on either of these four, and to each of them, I believe, some specific was administered to which they blindly trusted their lives^g. To one of these (January, 1789) I
was

^c Rev. Mr. Ashby's letter, September, 1796.

^f Ipswich, Suffolk.

^g Vide Appendix.

was called in the last agonies of his existence, but as I was about to set out for his habitation, a second messenger arrived with intelligence of his death. The reader, on perusing the case, will find it differing but little in its symptoms from the greater number related.

In removing the bitten part, much care and judgment are requisite. It cannot be doubted but a few failures, of which we read, arose from want of attention to the minuter circumstances in the operation. On removing the piece, the under surface should be carefully examined to find whether the wound penetrated through. If this be discovered, a deeper piece still should be taken out, so that no mark whatever of the tooth be perceived, but the under side be pure and sound. For should the least speck be left, which had been touched by the poisoned tooth, there will be no certainty of safety; the operation will prove nugatory. I speak of recent injuries; but if days have elapsed, the ensuing inflammation, in the progress towards cicatrization, will alter the appearance, and render other cautions necessary.

Mr. Hunter, on cutting out the piece, in
one

one case, examined the under surface ; no marks of a tooth were perceptible. But on examining the superficies of the wound from which the piece was removed, he observed a part in the middle hollow underneath. This was proof of his not having cut sufficiently deep, and nothing but this nice examination could have convinced him to the contrary^h.

I shall, without hesitation, then, recommend, and would enforce it, were I able, a piece to be cut out round the part wounded, making the incision at the same time pretty deep, to prevent accidents, from leaving any of the animal's saliva behind. I can see little cruelty in this, when we compare short temporary pain to the dire scene that we have reason to expect.

The ancients recommended a similar treatment, which modern authors, copying from them, adopt. Mead, among others, though so confident in his specific, readily assents to this method.

Dr. Cullen, also, coincides in the same opinion.

^h Mr. Home gives Mr. Hunter the merit of being the first who performed excision in this country the time ; is not specified. Vide Home's account of the life of Mr. Hunter, prefixed to his posthumous works.

nion. "In this," he allows, "every body agrees; but with this difference, that some are of opinion that it can only be effectual when it is done very soon after the wound has been made, and they, therefore, neglect it when this opportunity is missedⁱ."

With respect to the actual cautery, enough perhaps has been already said^k. If sufficient substance be destroyed it will doubtless be effectual, but many reasons weigh with me in giving preference to the knife. The part being destroyed, in either of these ways judged proper, and the patient submits to, it has generally been recommended to keep up a discharge for a considerable time after. Dr. Fothergill attended two persons, the master and the maid servant, bitten by a mad cat, the maid's wound did not heal up, though endeavours were used for that purpose, for several weeks. The little scratch received by the master soon healed. He became affected with Hydrophobia and died; the servant escaped. Hence the propriety of keeping sores open has of late been urged. In the cases, however, wherein I am consulted, I now omit it; because, on reflection, I find no good reason

ⁱ Vide First lines vol. 4, p. 109.

^k Vide page 139.

reason to offer for this injunction. For if, as we hope from the previous accuracy in the operation, no poison remains, where is the utility of keeping a fore open? Even supposing the poison had not been all removed by the knife, it seems doubtful whether this method could eliminate from the fore the remaining venom. We know that in every open surface there is an absorption: a wound cannot cicatrize without it. The inflammation kept up by this process, there is reason to believe, will quicken the action of the vessels, and a change may be produced favourable to a *speedier*, instead of a *retarded* absorption, whereby the entrance of the poisonous particles into their mouths will be accelerated. I have several examples to offer where the fore, after excision, was suffered to cicatrize *speedily*, and the process hastened by surgical means, both from my own experience, and from the practice of others; where safety was as equally and completely insured, as if the wounds had been turned into a running ulcer, not for forty days only, but for as many months.

I saw, about seventeen years ago, three cases of this kind. These persons were all bitten by the same dog, in about ten minutes from
each

each other, (the animal was certainly mad) and in less than a quarter of an hour more, the operation was performed in the hospital where I then attended; no Hydrophobia ever appeared.

In 1789 six persons were bitten by a dog, viz. three men and three children. The dog died mad next day. I was consulted by one of the patients for himself and his five fellow sufferers, and these means were strongly inculcated, which I have reason to believe were not neglected; for the alarm through the country at this time was great from numerous accidents of the same kind. It may not be improper to notice, that this animal also ate food just before his death, as this has universally and erroneously been made a distinguishing mark of freedom from infection.

In February, 1790, another person consulted me who had met with a similar accident. He had been bitten the day before by a dog suspected of madness; and in spring, 1791, a third applied on the same account. They all received the same directions; no running ulcer, but excision merely, was insisted on. From the frequency of these accidents and want of success in curing the disease, prevention be-

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comes a matter of the highest importance. I do not go so far as to assert that every person operated on, is indebted to it for his life, because it is impossible to decide whether the poison would in every case have been active ; but where so much is at stake we should act as if we were certain, in every instance, of the poison taking effect.

Cupping and scarifying, or burning gunpowder in the wound, have all been used, and warmly recommended ; but extirpation, where the part will admit of it without danger or much deformity, is always preferable.

Sometimes it happens that the part bitten is unfavourable for extirpation. This is the case when large wounds are received either in the lips, or about the face. In these parts a speedy cicatrization is desirable to prevent the deformity, which must succeed sores long kept open, where the bases are enlarged, and the loss of substance becomes greater ; and, if with the precautions already delivered, the wounded surfaces be removed, there can be little room for future apprehension.

Extirpation either in the upper or under lip, has likewise inconveniences ; a scar from a large wound must remain altogether unseemly, disfiguring the countenance.

This

This was the part bitten in the unfortunate case of Master Rowley. Caustics, however, were applied, soon after it was received. That they did not succeed might in part arise from the caustic not having touched every part of the wound; but with as much probability from some of the dog's saliva adhering about the gums or inside of the lip, from whence it was afterwards absorbed; for, "the lip was torn a good deal. The teeth" (of the dog) "had gone through and through, and had torn out a piece¹."

In such cases the Physician has a most difficult part to act. If he pays too great attention to appearances, he may fall into the opposite extreme, and lose his patient from lenity and regard to his looks. If he boldly advises extirpation, and his patient should survive, he may not escape censure, but incur his displeasure through life for disfiguring him.

The most unfavourable places are about the face; and of these, the cheeks, nose, and lips are most so. The fore part of the neck also, is not without inconveniences, yet it is better to use the knife on such occasions,

¹ Mr. Hunter's Letter to the author.

sions, than to suffer the patient to fall a sacrifice without attempting so rational a prophylactic. Should the worst take place, we have discharged our duty without trusting to chance for an escape.

M. Sabatier's patient, a gardener, was bitten in 1764 by a dog on the upper lip. The wound was trifling, and was dressed in the common way. Next day the same dog bit a young man, and scratched him in several places. He had no fewer than *twenty five wounds*; and some of them considerable. Besides these, they reckoned fifty scratches. *Twenty eight hours* after the accident, M. Sabatier applied butter of antimony to the wounds. These were kept open a considerable time, and he escaped the disease. Was it to the caustic, or the subsequent discharge, that the patient owed his life? I hesitate not in attributing it to the former. The gardener was less fortunate; nothing was done to him, and on the *fifty fifth* day from the bite, he took the disease, and in two days after was dead.

In 1775, M. Sabatier had another patient, who had suffered from a similar accident. The caustic was applied in this case with happy effects. This patient was a soldier. But another
other

other person bitten by the same dog and neglected, was seized with the disease on the *fifty second* day from the bite, and in *twenty four* hours after he ~~also~~ died.

The method of using caustic followed by M. Roux, has many advantages, though suffering the wound to bleed, as a part of the practice, after deep dilatation, can add nothing to the patients safety. He does not apply his caustic, which is deliquescent butter of antimony, till next day, when the wound has ceased to bleed. This precaution is judicious; for the blood would dilute and weaken the caustic; but applied in this way it will penetrate at least two lines deep. The caustic being received on a wooden probe, is thrust to the bottom of the wound. He extends it not only to every part of it, but likewise over the adjacent skin; and then over the whole is applied a blister. When in this manner a deep ulcer is produced, by the assistance of peas, a discharge is kept up for forty days.

Professor Mederer's (of Friburg) method of treating cases of this kind is almost on the same principle, though with the formula of ablution. It consists of washing the wound

well; first with a diluted solution of lunar caustic in water; (half a drachm of the caustic being added to a pint of water) and afterwards in warm water alone; and this he directs to be repeated. This may be considered as a powerful detergent, and in this light judiciously used. Would not the caustic afterwards applied over the surface be a proper measure, and a further security?

As the bite serves only the purpose of inoculation, the danger will be various according to the formation also of the part in which it is given; if less vascular, it is less; if more, it becomes the greater. From a review of all the evidence, I am inclined to think, that the disease comes on sooner in the instances of infliction among numerous vessels.

In 1790, a bitten person was brought to Dr. Western; this was in Jamaica where the Doctor then resided. The wound was *dilated*, and mercurial ointment mixed with common turpentine applied. This brought on a large discharge. Wine, and the peruvian bark in substance and in large quantities, were administered for eight days, gradually increasing the dose. Six months after the boy remained well; and
the

the Doctor attributes the cure to the wine and bark.

The dog's madness was proved by his having bitten two sheep at the same time, which in ten days after died highly rabid. Every part of the practice in this case might contribute its share towards prevention; and allowing infection to have existed, it chiefly derived its efficacy from the escharotic, with which the wound was treated, and which destroyed its surface.

When the cheek has been wounded and penetrated through, by which means some of the poisonous saliva must have touched the inside, and thus escape the knife, the caustic, or other means used, we should order the patient, provided we see him soon after, to wash and scour the inside of the mouth with detergents; salt and water, a solution of kali, &c. and this should be often repeated, using a piece of sponge to absorb the moisture, carefully washing it after each application, while the knife, or proper caustics, are externally employed to destroy the adjacent lymphatics about the wound.

With respect to detergents in recent wounds of this nature, no doubts of their utility can

be entertained. A cat became mad, flew upon her mistress, and bit her. The maid, who was washing linen at the time, ran to her assistance; laid hold of the animal to disengage it, and in the scuffle received a bite in the arm; but with the courage, or carelessness that persons in her situation sometimes happily possess, returned to her wash-tub without farther attention to it. The mistress took the disease, and perished in consequence; the maid escapedⁿ. In pursuing her labour, the wound was well washed by the soap lees, and its detergent quality, it may be affirmed, proved a preventative by removing the saliva from the abraded surface.

Cupping may be used also; but in cases of this kind, I do not see what advantage is to accrue from scarification merely; yet, if it be considered of material importance by the operator, I have no objection; for it is better to do too much than too little where so much is at stake. If, after using these means, we should not succeed, we know the obstacles, and can pronounce them beyond the reach of human skill.

Dr. Haygarth has laid down some useful rules

Mr. Ashby's Letter.

rules for washing the wound. The death of three men from this malady, in the autumn of 1788, induced him to turn his attention to it. He lays considerable stress on the manner in which ablution is performed. Where the knife cannot be conveniently used, his method certainly bids fair to secure the patient from future evil. First, he directs the saliva to be carefully wiped from the part with a dry cloth; and afterwards to wash the wound with cold water, not superficially, but with the most persevering assiduity, for several hours. After this, he thinks warm water may be used with advantage, which is to be done by pouring it on the part from the spout of a tea-kettle in a continued stream. He shows the importance of careful ablution by pointing out, that if the poison was of a dark dye, like ink, "we should all be aware that plenty of water and patient diligence would effectually wash it out," for we could judge of it by the dye. If this method be neglected till an inflammation of the part has taken place, the surface should then be shaved off, and cupping glasses may be used. In bad cases the wound should be deeply opened, and dilated in every part. To show the importance of diligent ablution, he

he draws an argument from the inoculation of the small-pox, where an attempt was made to wash the poisonous matter away, to prevent the disease, nevertheless it appeared at its proper time. This would not have been the case^a had the ablution been properly performed, but instead thereof, it was done “secretly, hastily, and timidly by a female hand.”

Mr. Hunter placed his chief dependence on the lunar caustic in the case of Master Rowley^o: it failed. Several reasons may be offered for the failure without implicating caustics in general.

1st. The part was unfavourable, for it was the lip; and this, also, cut quite through, where some of the dog’s saliva must have fallen on the gums, or been scattered to some distance over the inside of the cheek, &c. “The lip was tore a good deal----the teeth had gone through and through, and had tore out a piece.”

2nd. Though all the part had been destroyed, yet since some of the particles of the infected saliva might have been thrown beyond it,

^a Vide Haygarth’s Letter to Percival.

^o “My whole dependence was on the caustic, but did not object to the others (Ormskirk and Tonquin nostrums) being given.” Letter to the author, 1785.

it, and, of course, beyond the reach of either knife or caustic, it was not in the power of man to say where to find it. Granting these, it proves no more than what has been already admitted ; that there are some parts more than others, unfavourable for excision, caustic, or cautery. The legs, the arms, the thighs, the trunk of the body, and even the fore part of the neck, or the face, will admit of excision, &c. The cheeks, lips, and nose are the chief places where excision may be doubtful.

Another instance, however, has lately happened of the failure of extirpation, which may give rise to farther doubts ; but let the reader pause and examine it with accuracy^p. He will find reasons, I apprehend, for suspending his censure against the operation. Though the surgeon seemed to have performed it with skill, and with accuracy, and, as it would appear, cut sufficiently deep, yet no detergent was used immediately after to cleanse the surfaces of the new wound, but the lips were directly brought together by suture. I do not, however, go so far as to say that saliva was left behind, but it has already been seen by Mr. Hunter's operation, how much nicety and accuracy

^p Case of Hogg. Vide Med. Comm. D. ii. vol. 10.

accuracy of observation is necessary for successful extirpation^r.

Hogg had two wounds ; one in the calf of the leg, the other in the hand, to which excision and ligature were applied. A third remained, but it being a mere superficial scratch, Mr. Johnston thought it sufficient to touch the surface with lunar caustic. In this he acted as some eminent men have done.

It is impossible to pronounce, with certainty, from which of these three injured parts the disease took its origin ; but I am inclined to suspect that it arose from the scratch to which the caustic was applied. The precautions which Mr. Johnston used would appear to leave less room to suppose that venom was left in the wound, notwithstanding the omission of ablution after excision. The lunar caustic is weak, and the time necessary for throwing off the eschar, after which it can only be re-applied with effect, renders it ill adapted for the present purpose. From my remarks on this case, I am far from having it understood as conveying the smallest reflection on this skilful Surgeon. Similar means (viz. lunar caustic) have failed in the hands of others,

^r Vide page 141.

others, as we have seen, whose knowledge cannot be disputed, and whose circumspection seldom forsook them; but it becomes more than commonly difficult, in multiplied and complicated *rabid* wounds, though absolutely necessary for success, to catch every minuter circumstance.

With respect to caustics, in these cases, one general remark may be made, viz. that the stronger, not the weaker, should be had recourse to. Whatever dissolves animal substances most perfectly and speedily, penetrating deep, is the fittest for the present purpose.

The *kali purum* is of this kind. It forms immediately an eschar to some depth, which may be immediately removed by a spatula; and by re-application of the caustic, another be taken off; and this being repeated, removing stratum after stratum, we proceed to the depth intended. In this mode of using caustic it would seem equally safe and equally successful with excision by the knife.

3d. *By Specifics.*

In all ages, from almost the first appearance of the disease, men, as it was natural, began to turn their thoughts not only towards its prevention,

prevention, but its cure. Various were the substances which ignorance and superstition, in conducting this research, led them to propose. That their investigations were not crowned with success, are too well known; and although the darkness of former ages, with respect to science, might be an apology for introducing the numerous train of inert trifles, termed specifics, which their practice presents; yet later times enjoying the advantages of more enlightened investigation, amidst the various and luminous discoveries which patient labours have produced, can boast of having penetrated but little farther than the sages of 2050 years ago^s, into the abstruse nature of this dreadful malady.

Specifics have abounded from their days, down to the present. The word has something fascinating in it; and when pronounced, reason seems to desert her abode. The understandings of the greatest men of the respective ages in which they flourished became clouded, howsoever penetrating in other investigations, when this idea took possession of their minds. No illustration is necessary to prove this. The variety of

^s The time, according to some, when the disease first appeared.

of specifics, their ever-changing compositions, and their constant failures, stand forth as the monuments of their insignificancy, and the truth of this observation. Much mischief have they produced ; while a single instance of advantage, howsoever loud their inventors may have proclaimed the contrary, cannot be fairly and openly brought forth in their favour to satisfy rational investigation ; therefore, without apprehension of a mistake, I dismiss them all as nugatory in the extreme.

Let no faith whatever be placed in *specifics*, and certain *preventatives* so called, for it will be trusting to a broken reed, to a staff insufficient to afford support. Experience has proved them fallible and trifling ; for, from a knowledge of the composition, it is not difficult to demonstrate that such ingredients as compose them, are singly or unitedly, altogether inadequate to oppose the evil.

We shall, therefore, pass over that of Æschiron, composed of burnt crabs, as mentioned by Galen, and Oribasius ; the famous opiates of Scribonius Largus ; the boasted powder of Palmerius ; that of turpith mineral so much extolled by James ; the tin and mithridate, on which Myern and Grew bestow
so

so much praise ; also the root of the dog-briar or rose^s, said to be discovered in holy visions ; the liver of the mad dog broiled and eaten ; the pimpinella (burnet) of Henry II. King of France, which he is said to have discovered on his death bed to his physician Fernelius, with several others. Yet it will be necessary to take some notice of two or three still high in estimation with the public ; and extolled, even at this day, by some physicians of abilities and learning.

One of these, claiming our special attention, is the *Ormskirk* medicine. Its reputation has stood high for many years, and it is still held as infallible by many, especially in the northern and western districts of England.

Dr. Fothergill was amongst the first who conceived doubts respecting its virtues. The melancholy case of his patient Mr. Bellamy, for whom it was procured of the person authorized to sell it, and used according to the printed directions, gave grounds for suspicion, which

^s Spongia Cynnorhodia : P. Boccone wrote a treatise on its virtue. The Scicilians call it Sanatodos (All Heal). It is called by us Dog-rose, because celebrated in the cure of *rabies canina*. The part used is an excrescence growing about the root.

which its fallibility in many cases since has served to confirm. Let us examine of what this celebrated nostrum is composed. According to the analysis which it underwent some years ago, we shall not find in it a single active ingredient.

In the year 1777, Dr. Heysham, who wrote his Inaugural Dissertation on *Rabies Canina*, instituted five experiments for the purpose of discovering its component parts. These were made with the simple addition of water to the nitric and sulphuric acids. They were repeated by Professor Black with the same results, and consequently there can remain little room for suspicion of inaccuracy. From these it appeared, that the basis of the medicine was chalk ; and relying on its powers, a theory was hazarded relative to the nature of the poison of the rabid animal, which it is not our business here to examine. In a word, from the analysis of this eminent professor and his pupil, the whole composition is as follows, viz.

Half an ounce of powdered chalk.

Ten grains of allum.

Three drams of Armenian bole.

One dram of the powder of elecampane root,

And six drops of the oil of anise.

Such is the medicine on which the public has placed implicit confidence!!

I need not inform my medical readers, that chalk is a mere absorbent; that allum is an astringent; that Armenian bole likewise possesses a degree, though small, of astringency; and that the root of elecampane is considered as so insignificant a substance, that the colleges have long ago rejected it from the number of the articles of the *Materia Medica*; and as to the addition of a few drops of the oil of anise, it can be of no other use than to warm the medicine, and give it a more grateful flavour.

Next in order of celebrity comes the Tonquin medicine, a nostrum some time ago in equal estimation. What then shall we say of it? Little more than of the former. We owe it to the well-meant, though mistaken endeavours of Sir George Cobb, who many years ago brought it from Tonquin, whence it derives its name, as of inestimable value, and as constantly infallible amongst the Chinese; but experience in many instances shows the contrary, and proves its inefficacy. Let us examine its composition. We shall find it to be only 24 grains of native, and as many of factitious cinnabar, with 16 grains of musk. These are powdered and mixed together.

ther. No farther comments, it is apprehended, are necessary on the subject.

Musk is an antispasmodic; so far it may seem useful in a disease, such as *Hydrophobia*, where such violent spasms take place in the throat, face, &c. but it has not sufficient power to oppose, and remove the malady. Yet we must own that the Tonquin appears a better medicine than the Ormskirk, since it possesses a small portion at least of one active ingredient.

With respect to Dr. Mead's famous powder,^v I shall only mention, that it was a composition of ash-coloured ground liver wort,^w and black pepper. The former was the ingredient on which he depended, and to which the virtues of the powder were attributed. *Materia Medica* writers tell us, that this lichen is a warm diuretic; but from the taste little or no warmth can be discovered; and it is a general rule which, we believe, holds good in the vegetable kingdom, that where little or no sensible qualities

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^v Pulvis antilyffus, or mad wort. This powder was distinguished by this name from the herb alyffum, which was supposed a specific against the bite of a mad dog.

^w Two ounces of the Lichen ciner. terrestr.

One ounce of piper nigrum

Were beat together, and formed this powder.

^w Lichen cinereus terrestris. Linn.

are discoverable, little or no virtues for the removal of diseases are found.^x

This medicine was a substitute for the jew's ear of Dampier. The principles on which the cure was attempted by several antient physicians were those of diuretic. Whatever, therefore, possessed this quality in a superior degree, they adopted. One of them^y used even cantharides in substance, and in quantities which produced bloody urine.

The same theory was adopted by Dr. Mead, in the composition of his powder, and we have in this noted specific only one supposed diuretic substituted for another.^z His use of the cold bath was even upon the same principle; for, according to his explanation, its chief action was a constriction of the surface whereby "the humours were thrown upon the kidneys."

This powder was afterwards inserted in the *Pharmacopeia*, and on the pompous authority of its success in *thirty* years practice; but an addition of *fifty* years more proves, beyond a doubt, its insignificance. Nor did this escape the penetration of Boerhaave, who ranks it amongst those insignificant trifles, calculated only to deceive whoever
place

^x Insipidæ et inodoræ vim medicam vix exercent, Linn.

^y *Ætius*.

^z *Lewis's New Dispensary*.

place their trust in them. To collect, and relate the cases in which this has failed, would be superfluous; they are many, and the public have at length consigned it to merited oblivion.

If we examine the accounts of Hydrophobic cases, we shall likewise find several where the Ormkirk medicine has been attended with no better success; sufficient, in my opinion, to induce us to hold it in a very inferior light. Had we only that of Mr. Bellamy, it should lessen our faith in it; as one positive proof of failure is worth one hundred negative proofs of its success; since it becomes impossible to tell whether the bitten person, to whom it had been administered, would have become affected with the disease; whether it had any share as a prophylactic. But we have three more of its failure, related by Dr. Vaughan. In the instance of Master Rowley both it and the Tonquin, as also mercury were administered, with strict attention, from a few hours after the accident, till symptoms of Hydrophobia appeared.^a

It has been said, that botanists are more intent after *specifics* for the bites of poisonous reptiles than other men.^b They cultivate an amia-

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^a Since this time it has failed in many other instances, sufficient to condemn it for ever.

^b Vid. Amer. Phil. Transf. v. 3.

ble branch of science ; and if in this they err at all, it is so far pardonable, as it arises from a wish to be useful. What is said here of poisonous reptiles will apply equally to rabid animals. But let not credulity lead us from investigation, least the only means to obviate the malady be overlooked, and opportunity of saving life lost. I am unwilling to denominate any remedy a *specific*. The Peruvian bark, though its exhibition be attended with so much success in intermittents, and some other species of fever, is not *specific*, for it frequently fails ; and other kinds of bark, and some mineral substances are discovered to be equally powerful. We are sufficiently acquainted with the virtues of arsenic in diseases of marsh effluvia, or where *tonics* are indicated. I am not even inclined to call mercury a specific, I mean in the removal of *lues venerea*. There are many cases which it does not cure, at least without auxiliary medicines. Let us endeavour to investigate the nature of the changes that ensue in the habit in consequence of these diseases, a knowledge of the remedy will then follow. True philosophy will in due time banish them along with the other hobgoblins of the darker ages.

I am somewhat surprised, however, to find an author, who has slightly touched on this disease,
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and who, perhaps, has also read the first edition of this work, argue for the efficacy of the *Ormskirk nostrum*.^b He draws his conclusions from *two* cases, and from them adheres to the belief of its virtues, and even blames those who would *disturb* the public faith on this subject. Let us hear how he proceeds. The persons bitten whom he saw were two boys; the dog that bit them was proved to be mad, for he died of the disease; as did several others, the Doctor tells us, which the animal had bitten. Both of these patients took Barton's *Ormskirk* medicine; the wounds were dressed with it. One of them was bitten on April 10, and on October 11 following he remained well. The other was bitten on May 30; his wounds were dressed with Hill's and Berry's *Ormskirk* medicine; and a dose of it was given him. This author reasons as if the boys had really been infected, whereas it is plain they never were; because, to grant this nostrum cured them would militate against every case of real infection, in which the medicine has ever been administered. The case, indeed, seems to refute itself, as he has related it; for *two different sorts* of the medicine were used; one called *Barton's*, and the other *Hill's* and

M 4 *Berry's*

^b Dr. Robertson's Observations on Fever, p. 457.

Berry's, two rival venders, and at variance. The *nostrum* then was not the same in both cases, yet both were cured, or remained free from the disease by these different compositions; and so they would had they taken instead of it a little crab's-claw powder, for they were not infected.

“ I cannot foresee any good purpose,” he goes on, “ that the declaration of this eminent surgeon's^c opinion could answer; but, I fear, contrary to his intention, it might have done great mischief, had it been suffered to pass unnoticed; so many unfortunate people having been bitten, and done well from taking the *Ormskirk medicine*, has so deservedly placed it high in the public faith, as a cure for canine madness, that *any* attempts to destroy this *faith*, without communicating a substitute more to be depended upon than this *Ormskirk*, is, in my humble opinion, neither philosophical nor justifiable.” I draw exactly the contrary conclusion, and would think it highly justifiable to destroy *blind credulity*, satisfied without investigation, and holding absurdities for truths. If we continue our confidence
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^c Perhaps this alludes to Mr. J. Hunter, for no name is mentioned,

in what daily fails, where is the prospect of exertion in quest of more efficacious remedies?

Dr. Percival attributes more to this nostrum than might have been expected from so philosophical a physician; and his authority would likely have stamped some credit on it had he not, at the close of some ingenious arguments, given up the subject, and apologised for what he had just said.^d

Hear what Mr. John Hunter's experience compels him to advance respecting not only this, but likewise the Tonquin nostrum. "All the means recommended were used in Master Rowley's case. I saw him a few hours after the bite. He took the Ormskirk medicine by the direction of Mr. Berry, who sells it; therefore we must suppose it was properly given. He also took the Tonquin medicine, viz. musk, cinabar, &c. as also rubbed in mercurial ointment till his mouth was fore."^e

From all these authorities the inference is obvious, that these long-boasted remedies are totally destitute of the virtues for which their abettors and inventors have strained to gain them credit.

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^d Vid. Hints to Dr. Haygarth on Canine Madness.

^e Letter to the author, 1785.

4th. Vinegar.

This has of late been recommended as another preventative. Dr. Moneta^f is among the number who extol its virtues. He asserts his having prevented the disease by it in more than sixty cases, when used as he directs, immediately after the bite, and for nine succeeding days, as an external application to the wound, which is to be previously washed with warm water, cupped, and scarified. He mixes it with a fourth part of melted butter, and dipping therein compresses, binds them over the part, renewing them frequently. While this process goes on, an ounce and a half at a dose, is frequently administered internally; and this is continued till about the 15th day, not thinking it necessary, however, to keep the wounds open longer than the 9th day. The disease, he assures us, has been stopt at its commencement by the same means. Did experience in the hands of other men furnish similar events, the discovery would be as valuable as the method is simple.

Vinegar

^f Physician to the King of Poland, who has lately written on the subject.

Vinegar has also been applied in Italy, and equally extolled ; but since that we are informed it has failed there in one instance ; and I am apprehensive, the inference to be drawn is, that in those cases wherein its success was announced, there existed no rabid infection ; and that in this case, where rabid infection operated and proved fatal, the infallibility of the remedy was put to the test.

At Warsaw it had likewise a tolerable fair trial in two instances.

Eleven persons out of seventeen were committed to the care of Dr. Wolf. He did not neglect this opportunity of putting to the test the most noted specifics which were recorded, or were fashionable at that time. It was the 9th day after the accident when they applied. He made deep scarifications in their wounds ; used careful ablution, warm fomentations, with vinegar, salt, and theriaca ; and kept open the wounds for 80 days, in those who lived so long. Every 14 days copious V. S. was used ; and every 7th day, a strong cathartic of salts and jalap administered. Their diet was chiefly vegetable ; their drink only whey and water. The herb *matrisylva*, in as large a quantity as could be procured, was recommended, which they daily ate. They likewise ate plentifully of the herb *anagallis*

gallis (flore puniceo) another noted specific ; and at the same time did not omit the famous composition of Palmerius. Besides this, which was the general treatment, two were daily rubbed with a dram of mercurial ointment, and were purged with calomel. To two others were daily prescribed four ounces of vinegar, three drams of the tincture of poppies ; and at night they were ordered half an ounce of rob sambuci. Another took every day sixteen grains of camphor, four scruples of nitre ; and at night half an ounce of the same rob. Two others took twenty-four grains of musk, with fifty grains of cinnabar ; other two took from forty to sixty drops of spirit of sal ammoniac, prepared with quick lime ; and the last took a scruple of chrySTALLISED salt of tartar prepared by the mixture of a little spirit of sal ammon. with a solution of that salt.

An officer, one of the number bitten, came into the city on the day after the accident, and had the best advice the place afforded ; besides which, as a preventative, he took the bark and camphor very copiously ; yet, in the 7th week he was seized with the disease, and died. One of those under the vinegar course fell ill on the 33d, and died hydrophobic on the 36th day. They vomitted and bled him copiously, but
without

without effect. The other, an old man, is said to have recovered after an indisposition which they attributed to the disease. He was purged and bled, and took besides *morfulæ balsami Peruviani*, and drank lemonade. After his recovery 100 drops of *sp. sal ammon.* were daily taken. A curious remark is added respecting this man. It is affirmed, that the blood drawn during this illness, which was certainly not hydrophobic, had a very foetid smell. This, perhaps, might be attributed to the balsam, and other medicines used.

The man to whom the camphor, nitre, &c. were given, fell ill on the 33d day: he underwent a very powerful treatment, but ineffectually. “He was thrice copiously bled; was plunged forcibly into the coldest water, for the space of two hours, and was nearly drowned. He was clystered with effect. He himself forced down, with incredible aversion and labour, a great quantity of drink; by which he vomitted more than fifty times abundance of frothy slime. He took several ounces of oil, and several boluses of castor and opium, of each four grains, without effect; and died the 4th day.”

A girl, who used the musk with cinnabar, was attacked with Hydrophobia on the 62d day, and died on the 65th. Her companion, a pregnant

nant woman, had taken till this, the same medicine, which she now exchanged for sp. sal ammon. Nothing farther being said, it is presumed that she continued uninfected; but a third woman, who had taken nothing, fell ill on the 40th day. She is described, as suffering under the usual symptoms, with the addition of excruciating pains in the bowels. She took, in two days, no less than two bottles of brandy, refusing every other liquor. To this the doctor ordered daily two boluses of castor and opium, and advised her likewise to add to her brandy an equal portion of oil. She recovered. This woman certainly never had the Hydrophobia. Apprehension of the fate of her companions, bitten at the same time, might have alarmed her.

The survivors continued their prophylactic treatment to the 100th day. How far the remaining number would escape, could not then be known, because the time of danger was not over. He mentions four of them who took nothing, being in as good health as any of those under his care: and the conclusion from the whole is, that had his surviving patients taken nothing, they would have been equally in health.

5th. By the Cold Bath, whether Salt or Fresh.

Next comes the cold bath. From almost the earliest ages of medicine this has been practised, not only as preventative, but as a means of cure ; and at this very day is used for both.^g The limits prescribed to these pages do not permit a minute discussion of this point, nor a formal refutation of every case brought in support of this practice ; but since it still continues to be celebrated as a certain prophylactic, with a string of reputed cures in proof, it becomes expedient slightly to touch on the subject. After maturely weighing all that has been adduced in its favour, my conclusion is, that it never at any time prevented the operation of rabid infection from coming into action at the time of its proper law, nor cured the disease when its destructive energy overwhelmed the system. It is a simple corroborant ; but the strongest remedies of this class have never proved preventative where rabid virus has been received. These, indeed, may be used ; against them there lies no objection. They may prevent, provided the patient's strong faith

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^g Several were bitten in Aug. 1794 : they went to Brighton immediately after, to use the salt bath.

urges him to their trial, depression of spirits, and the gloom that hovers over the mind from apprehension of the disease ; but such applications ought not solely to be relied on ; if the malady is to be prevented, it must be by means such as have lately been under consideration.^h

As to the preventative, cold water, reason can say nothing in this place for its virtues, whether it be simple, or impregnated with salt ; whether it be in ponds near the patient's habitation, as advised by the antients, or in the sea, as later authors have chosen to recommend. There are, I believe, only two ways in which salt water can act, either as a general corroborant, as just considered, or as a gentle purgative, from a small quantity swallowed during immersion ; for sudden immersion, even almost to drowning, has been the common method used. Admitting then, though I believe it will not be granted, that much water enters the stomach during suffocation in this element, either partial or complete, that a sufficient quantity has been swallowed to produce catharsis ; what are our expectations ? It may wipe some fordes from the primæ viæ ; it may cleanse the alimentary canal ; but purging will not kill the poison, nor
eliminate

^h Excision, &c.

eliminate it from the wound. Neither irritation, according to the pathology of some, as producing the disease, nor absorption, as maintained by others, will be stopped in their progress by the operation of a purgative, nor the discharge of alvine feculencies.

Were I inclined to bring forward a numerous train of cases of the failure of bathing, books would supply me; but one or two will prove the assertion as well as a thousand. Mr. Nourse's patientⁱ (a lad bitten in the thumb) was ten times dipped in the sea, took likewise Mead's specific^k for forty days. Was he cured? No; for he died hydrophobic nineteen months after; being in the interim cut for the stone and perfectly recovered from the operation.^l

Celsus, I know, recommends it strongly; not however as a prophylactic, but as a remedy for the removal of Hydrophobia itself. He observed the patient's inability to swallow liquids, and saw at the same time his great desire for them. In order then, that his thirst might be quenched, he directs the sufferer to be thrown headlong, and

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ⁱ Vid. Phil. Transf. No. 445.

^k Pulv. Antilyff.

^l Mayerne recommends bathing, and limits the number of dips to nine, imitating the Pythagorean numbers. It is scarcely necessary at present to mention this superstitious regard to the number nine.

and unexpectedly, into a fish pond, and ducked several times, that “his thirst and dread of water might be cured together.”^m

It is needless to make any comments on this treatment. The reader will easily perceive it to be founded on mistake. From this, however, the practice seems to have slid down to posterity, and the original intention to have been mistaken, as it was exchanged for one on no surer foundation, viz. that of a prophylactic.

We find, that in the days of Van Helmont, who lived so late as the sixteenth century, that it was only used in the hydrophobic state. This author relates, that he saw a patient ducked in this manner in the Netherlands, near Ghent, at a place called *Sluys*. Weights were tied to his feet, so that he could be kept under water, or hauled up by a rope fastened under his arms, at pleasure. He was thrice ducked; on the first immersion he was suffered to remain under water *ad spatium miserere*, which is about a minute

^m “Miserrimum (Hydrophobia) genus morbi: in quo
 “simul æger et fiti, et aquæ metu cruciatur. Quo op-
 “pressis in angusto spes est. Sed unicum tamen remedium
 “est, nec opinantem in piscinam non ante ei provisam pro-
 “jicere, et si natandi scientiam non habet, modo mergi
 “bibere pati, modo attollere; si habet interdum deprimere,
 “ut invitus quoque aquâ satiatur. Sic enim, et fitis et aquæ
 “metus tollitur.” Cels. de Medicin. l. 5, c. 27.

nute and half: a sufficient time to suffocate him, though not irrecoverably. On the second and third he was allowed only to remain *ad spatium salutationis angelicæ*, i. e. about ten seconds.ⁿ This man was a cooper from Ghent. It is added, that he was cured by this treatment.

The case of a girl is related in the history of the Academy of Sciences at Paris, and said there to be cured in the same manner; and a medical friend of mine is of opinion, that he saw a person prevented from Hydrophobia by the same means. Two were bitten; one used the sea-bathing a considerable time, and escaped; the other did not bathe, and died. But it may be fairly concluded, that had the sea bath never been used in this case, the person would have escaped, because he was *not* infected; and had the other bathed, with all the diligence recommended, he would have died, because he *was* infected: and this conclusion we draw from facts in similar instances.

Morgagni mentions two cases where death succeeded the cold bath: in the one, the patient

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died

ⁿ If the first of these psalms, viz. the 51st, be repeated in a distinct voice, and without rapidity, it will be found (measuring by a stop watch) to occupy about one minute and thirty-five seconds; and the second about ten seconds.

died the night following; and in the other, a little after being taken out.

The child Jones was bitten in the autumn, 1796: he was immediately taken to the sea coast and bathed; but it did not prevent the disease, to which about a month afterwards he fell a victim.^o

Dr. Mead expressly tells us, that he knew many die raving mad who had undergone this treatment. Default saw several proofs of its inefficacy in one year. Four men were bitten by a mad wolf; two of them were dipped, yet died within the space of one year. Choisel gives his testimony against it; for he declares, “not one of those who depended solely on this remedy survived the bite more than thirty-three days.” But why multiply examples? These are sufficient to condemn it. I shall rest satisfied then with the mention only of one more; I mean the hydrophobic whose case is related by Dr. Munckley.^p In the afternoon of the same day on which he was bitten, he went to the sea: he stayed there ten days, during which he bathed constantly; yet, in the space of about six weeks, he became hydrophobic, and died.

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^o Vid. p. 119. ^p Vid. Med. Transf.

The words of a medical philosopher, high in the public esteem, may be quoted on this occasion. “ I knew,” says he, “ where there were twenty-one people bitten by one dog. Nothing was done for any of them, and only one was taken ill. If they had all taken medicines then it would have been said, that they only lost one out of twenty-one.”^q Now had all these people bathed in the sea, it would have had the reputation of a preventative in no less than twenty cases out of twenty-one; sufficient, surely, as it would seem to confirm its virtues.

As a species of bathing, it may be necessary to notice the shower bath. Boerhaave furnishes us with an example of it: he poured buckets of cold water on his patient’s head, and says, that by this means he brought him to swallow; but it proved equally futile with immersion. He died soon after.

In the case laid before the public in 1791, by Dr Ferriar,^r valuable both for the history, and the accurate anatomical examination, and the information conveyed, the Doctor gives it as his opinion, that the *cold bath*, with the free use of *bark* and *opium*, are strongly indicated. He

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^q Mr. Hunter’s letter to the author.

^r Vid. Med. Facts. vol. 1.

speaks not, however, of its use as a prophylactic, but in the disease itself. The appearances of the inflammation, being of the erysipelatous kind, warrant, he thinks, this conclusion.^s

I must not, however, be understood as absolutely rejecting the use of the cold bath immediately after such accidents ; but only in as far as it might lull into dangerous security the unfortunate person who might trust to it from mistaken principles, and from hasty recommendation, without, at the same time, pursuing other means more adapted for his real safety. These have already been pointed out.

If, therefore, to the destruction of the bitten part, he adds the cold bath, I am far from discouraging him. It will tend, like every other general corroborant, to give greater firmness to the system ; and in this way, along with the satisfaction he receives from having complied with custom, or the monitory injunctions of friendship, a degree of tranquillity may overspread his mind as favourable to future health, as timidity and despondency might have been detrimental. But I repeat it, that the cold bath, in any form, cannot *alone* prevent Hydrophobia, where infection,

^s Vid. History of the Dissection.

fection, sufficient to give it birth, has been received.

5th. By Mercury.

Several authors have insisted largely on the use of mercury in this disease, both as a prophylactic, and, like cold bathing, as a cure. Among these are James, Van Swieten, and Sauvages; and, later still, de Laffone,[†] with others. Dr. Cullen is likewise inclined to favour this practice, affirming its utility to be more supported by experience than most other medicines.[‡] But we have no right to determine with certainty in its favour. On the contrary, it has failed in so many instances on record, where it was used even a considerable time, that we have great reason to suspect its virtues, and might be justified in consigning it to the same oblivion with other noted specifics. De Laffone affirms, that it was administered to eleven out of fifteen persons who were bitten and torn by a mad wolf, on the 8th and 9th of December, 1775, within twenty-four hours of each other. Three of these, it seems, trusting to powdered oyster-shells (a remedy, it

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[†] Vid. *Methode aprouveé pour le traitement de la Rage.*

[‡] Vid. *First Lines of the Practice of Physic.* vol. 4.

is to be observed, somewhat similar to our Ormkirk) died raving mad. Also a fourth, a young woman, who did not apply for relief till two days before her death, and after Hydrophobia had commenced.

Blaise, a physician of Cluny, had the care of the remaining eleven.^w They began a mercurial course. One man, after using it for ten days, became hydrophobic, and died forty-eight hours after: and, it is added, that he died placidly, and in his senses. A second used it near a month; then became affected, was furious, and died in two days comatose. A third (a boy) who used it for eighteen days, was then removed home by his friends, who supposed him safe, but who, three weeks afterwards, died. A fourth was discharged likewise, apparently well, after using the mercury a considerable time; but, six weeks after, he also became hydrophobic, and died. Here then are eight out of the fifteen lost, four of whom were treated with mercury: the remaining seven have their cure attributed to it; but is it not as reasonable to suppose them never infected?

If we draw a comparison, it will be found, that a much larger proportion than seven out of fifteen

^w Vid. Mem. de la Soc. Roy. de Med. Paris, 1783, part 2d.

fifteen, bitten by animals really mad, escape the infection. Dr. Vaughan relates, that between twenty and thirty were bitten, and only the one, whose case he lays before the public, was affected. And, “twenty-one were bitten,” says Mr. Hunter, “by a mad dog; nothing was done for any of them; yet only one fell ill.” This is, surely, a convincing proof of what we now advance. It is added, in Monf. Blaise’s account, in confirmation of its virtues, that all those who recovered had used the mercury above a month. In the case of Abraham Palmer, who was bitten in 1783, we find mercury had a tolerable fair trial; but it was with equal bad success.

Dr. Haulston* gives an extract of a letter from a friend on the continent, wherein, among other information, an account is added of nine persons, in the same prison, bitten by the same dog, yet only one of them became hydrophobic: and it is affirmed by the bye, that he was neither the first nor the last bitten; nor yet the most wounded. He was under Dr. Haulston’s correspondent’s care, and died. Mercury was used in Master Rowley’s case. “He also rubbed in mercurial ointment till his mouth was fore;”^y but
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* Vid. Lond. Med. Journ. vol. 5, No. 4.

^y Mr. Hunter’s letter to the author.

with no better success than those we have pointed out.

Lassone and Blaise extol mercury from a supposed success in its exhibition; but they recommend at the same time a practice similar to that which I am endeavouring to establish. "It is most certain," says Lassone, "that the remedies we have employed have been very successful; (Is it because seven out of fifteen escaped?) but they would have been much more so, had they been used early, and particularly if almost immediately after the bite, those external means had been made use of, which appear to me indispensably necessary, viz. deep scarifications, cutting away the lacerated parts, and those adjoining to the wounds; the cautery; applying cupping glasses; and establishing copious suppuration, for a long time, in the part." We have given several proofs positive of the failure of mercury, though it was diligently and properly applied; and one of these alone is of more weight in forming an opinion, than an hundred proofs presumptive. It is needless to enquire who was the first proposer of this remedy. We may only notice, that it appears to be of no very modern date. Among others we find Palmerius directing it to be applied to the wounds inflicted by a rabid animal; but it was
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in the form, and for the purpose only of an escharotic, viz. sublimate and red precipitate, that the wound might be enlarged, and the discharge thereby increased.

Default afterwards advanced an opinion (for he did not endeavour to prove it) that canine madness was owing to minute vermicles; and as mercury was well known to be a powerful anthelmintic, he proceeded, on this supposition, to administer this mineral;^z and like others, who wish to celebrate and establish their favourite specific, he relates cases of its success, as he calls them. He also applied it in form of unction to the wounds. To this he joined the use of Palmerius's powder.^a Though Van Swieten is inclined to speak favourably of mercury, yet he is ingenuous enough to confess also its failure, and hints at a case in the Medical Essays, which we hold as a very convincing proof. For we are told of a youth bitten by a mad dog, who was then troubled with gonorrhœa, and who took at the same time his dose of *mercurius dulcis*, and every following morning his purge; yet the frequent use of this medicine did not prevent him
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^z Vid. Default Sur la Rage, 1734, 12mo.

^a Vid. Appendix.

from perishing; for a month after the wound was inflicted he died hydrophobic.^b

Dr. Dickson likewise tried it without effect. In the beginning of January, 1767, John Brown, thirteen years of age, was immediately carried, after the bite of a mad dog, to the London Hospital. The parts affected were the right cheek and shoulder. These were scarified, and allowed to bleed freely; then mercurial ointment was rubbed on them twice a day for ten days, without, however, producing foreness of the gums. Having no other complaints, he was dismissed the hospital at the end of three weeks, and continued well for three months, when he suddenly felt a pain in the bitten part, and in a few days after died hydrophobic. It is argued by several who extol it, that though it has failed when the body was only saturated therewith, and without spitting; and this continued even for a long time; yet it is not sufficient to condemn its use; for, if a salivation was raised, and continued for a sufficient time, they are of opinion, that there is great reason to hope for success. Cheyne held this opinion: "The cure cannot be certain," says he, "unless it be brought to rise to a quick salivation." His reasoning is as follows: "for,
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^b Vid. Med. Essays, Edinb. vol. 5, part 2, p. 590.

as the effect of this poison is quick, so must that be of its antidote.”^c Modern physiologists will scarcely acquiesce in this mode of reasoning. The cases quoted prove its failure; but by adding the following from authors of observation and experience, every doubt on the subject must vanish.

Etienne Champion was treated with mercury, and a strong salivation produced.^d

Briquet in vain used mercury three or four weeks to a salivation.^e

The Sieur Gravan was salivated a considerable time, with the same unfortunate event.^f

Messrs. Rebiere salivated no less than ten, and unsuccessfully.^g

M. Theisset treated seven hydrophobics with mercury, yet they all died.^h

Dr. Oudot had a female patient who died also, though it was largely exhibited.ⁱ

Three of Laffon’s patients died, though treated in the same manner.^k

A woman under Revolot’s care used it unsuccessfully.^l

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^c Vid. Diseases of Body and Mind, p. 103.

^d Vid. Appendix for Analysis of Cases from Mem. de la Soc. Roy. de Medicine, ann. 1783.

^{e, f, g, h, i, k, l.} Ibid.

Dr. François had three patients to whom mercury was likewise ineffectually exhibited.^m

Roux has collected several cases to prove its inutility.ⁿ

To these I shall add only two more. In the one Dr. Gray of Bengal exhibited it, keeping up ptyalism a considerable time; and Dr. Raymond of Marseilles in the other, used it for forty days, raising a salivation also; yet both these patients died hydrophobic.

Others, who praise this remedy, argue, with respect to its utility, on the grounds of analogy, between the increased flow of saliva occasioned by mercury, and a similar discharge in hydrophobia. It is supposed by them, that nature makes efforts to throw off the poison by these outlets; and assisted by mercury, which exerts a peculiar power over these, there is a reason, they think, to hope for success; yet experience does not confirm it. Let us remark, that in cases of salivation from mercury, the parotid and other salivary glands are constantly affected; but in Hydrophobia this, I believe, does not take place. In one dissection mentioned in these pages of an
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^m Vid. Appendix for Analysis of Cases from Mem. de la Soc. Roy. de Medicine, ann. 1783.

ⁿ Ibid.

hydrophobic subject, the parotid glands were cut through, and no more marks of disease or redness discovered, than what might fairly be attributed to extravasation from some small vessels opened by the knife. The fauces are not observed to be diseased, nor any part of the mouth: great part at least of the discharge appears to come from the stomach and œsophagus, by regurgitation into the mouth; and this may be noted as one of the peculiar and distinguishing marks of the malady.

The observations of Dr. Ferriar coincide with my own on this remedy; and I adhere the more firmly to my former opinion, from its being corroborated by so judicious a physician. He reasons on the dubiety of the practice in a similar manner to what I had formerly done, and I find nothing now to make me relinquish it. "I own," says he, "I have some doubts respecting the propriety of using a remedy which produces so great a degree of irritation in the state of high irritation attending Hydrophobia." But rubbing in strong mercurial ointment in large quantities, has succeeded in removing tetanus, one symptom of which is *difficulty*, if not *impossibility* of swallowing; and those who hold the connection of the two diseases to be so intimate, as to consider them almost one and the same, strongly re-commend

commend it; but the analogy is greatly invalidated by its want of success in every instance of its application in rabid Hydrophobia. It may be said, that this applies more to the cure than prevention: it will apply to both.

Another argument for exhibiting mercury is built on the analogy of its *specific* powers over the venereal disease, where the poison, like what we suppose in the rabid animals, is drank up, and carried into the habit by the lymphatics. But it does not follow, that because it may be *specific* over one sort of poison, granting it unlimitedly this property, that it becomes so over others different in their nature, though entering the body by the same channels. The small pox is an apposite example. Mercury never killed variolous poison, nor prevented the appearance of the disease, when once the habit was tainted. This then is totally unequal to support the cause for which it is produced. Besides, we found the saturation of the body with mercury fail in Hydrophobia; but for the most part saturating the body with mercury cures the venereal disease, equally, if not with more certainty, then when salivation is raised; therefore, if it be specific for killing the poison of a rabid animal, it should prove effectual in this way as well as in the other.

other. The arguments drawn from this source, I think, are not tenable.

Berkenhout, reflecting on what Default and Choisel had said relative to their supposed success with mercury, imagines the prevention, granting this to have been the case, to be attributed to the fat in the unguent involving it (for unguent was always used in this form, as well as mercury administered internally). "For evidence," he says, "is wanting to prove, that the internal, without the external application of the ointment, will prevent the Hydrophobia. May we not therefore hazard a conjecture," he goes on, "that the lard or fat, of which the mercurial ointment is made, is the real preservative?" Here he reasons as if cures had been made by it. "Is not this powerfully supported," he continues, by the analogy between the canine poison and that of the viper, which is effectually destroyed by the viper's fat, or oil of any kind applied to the part." He acknowledges, however, that this is mere conjecture, to be determined by future experiments. That oleaginous substances do not prevent Hydrophobia appears from a failure in a late case, not to mention others on record, where the ointment had also a trial; for "he rubbed in mercurial ointment
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till his mouth was fore ;”^o yet the disease, as the unhappy event proved, was neither protracted nor cured.

Dr. Houlston, it is true, reasons very speciously for it. “Is the inference just, that because the action of mercurials applied, for three or four days at most, will not cure the disease in its last hasty stage, the same remedy would have been of no avail in the interval between the bite and the attack? During that period a gradual and sufficient action of the mercury might have been excited; whereas, when the Hydrophobia has appeared, there is scarcely ever time for such effect.”^p The cases we have already mentioned set this entirely aside; but the following will illustrate it still farther. The little girl that was bitten at Glasgow, in 1792, was treated with mercury. Mr. Scruton supported a salivation for a week or two after the bite; yet it did not prevent the occurrence of the disease. She died on the 40th day after the accident. As far as mercury is an escharotic, the application of it to the wounds may be allowed; but its action is only as such. An instance of the bad effects of the prevalent opinion, that mercury is prophyl-

^o Mr. Hunter’s letter to the author.

^p Vid. Mem. Comm. D. 1, vol. 8, p. 306.

prophylactic, may be adduced in the case of a person of my acquaintance. The dog that gave the wound was only supposed, but in reality was not rabid. Without waiting the consequences, mercury was advised and pursued; and with such rapidity, that a high degree of salivation, which could not be checked for a considerable time in a habit naturally irritable, and now under the influence of fear, followed its exhibition. A train of symptoms, induced by debility, rendered this unfortunate person long an object of commiseration; and time and proper restoratives, long united, could with difficulty produce a perfect restoration.

I am inclined also to believe, that much mischief has been done by the injudicious exhibition of this mineral, in every disease in which it has been used. How many ruined constitutions do we almost daily behold from the injudicious use of it for the cure of complaints proceeding from unclean embraces.^q Few know its powers

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^q Douglas wrote some observations on this subject in favour of mercury, supported by the following curious reasoning, without attempting to produce a single fact, viz. "It will evidently appear, by fair analogical reasonings, and various experiments, that this antidote (mercury), which most effectually expels the malignant and deadly poison conveyed by the *sting of a harlot's tail*, must also be the best antidote against

over the human body, compared to the numbers who rashly undertake to prescribe it. It requires nicety to distinguish how far we should proceed in its exhibition, even in those complaints where its use is plainly indicated, and where the cure may chiefly depend on it. All those things denominated medicines are extraneous substances, i. e. foreign to the body; not being useful in supplying nourishment, or other deficiencies, from the waste it undergoes; or, in other words, they are poisons of various degrees of strength, according to their various natures; some of them highly deleterious, and speedily and powerfully active. According then to their powers, and the particular habits they enter, their effects are exerted, always exciting inordinate commotions. To prevent however a greater evil, a less must be sustained. Here is their utility, and here it should stop. To overcome this evil, i. e. the disease, without injuring the constitution, and leaving other complaints as the consequence of their exhibition, is the difficulty.

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against the sting of the scorpion, the bite of the viper, rattle snake, and all the serpents in the East or West Indies." We have refused already to admit reasonings drawn from such analogies. But mercury does not cure the bites of venomous serpents. He is right only in what respects the venereal disease.

6th. *By the Gastric Juice.*

The hint which Dr. Percival throws out, relative to the solvent powers of the gastric juice, is worthy of consideration. I believe, with this venerable physician, that this animal fluid has a great power in rendering poisons harmless; nay, perhaps, as he says, nutritious occasionally. The poison of the small pox, I think, has not infected the habit when taken into the stomach alone; but it is doubtful how far the seeds of several other diseases would act on this organ if primarily affected by them. As another means of prevention, let it therefore be tried; but let it be in cases only where material objections to excision arise from the local situation of the wound. Gastric juice can readily be procured at all times, and at all seasons. We can, on the shortest notice, kill an animal for this purpose, or obtain the part we want (the stomach) from a neighbouring butcher. Should the carnivorous be preferred to the granivorous animal, from a greater supposed activity in this liquor, cats, dogs, or crows are almost always in our power. But the author of this suggestion does not object to the saliva of a healthy young

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person: its virtues might still be rendered more strengthening and active, it is added, by uniting it with the gastric juice of a calf, "by chewing rennet well freed of its salt." But in the operation of freeing it from the salt, would not a considerable part of its virtues be lost? "The spittle is demulcent, inviscating, and capable of changing the qualities of bodies by its fermentative nature." These are to be applied to the fresh wound, and renewed once or oftener in the day. The virtue of saliva applied to sores, is well known to the common people in most countries, and practised by them. The fasting spittle, possessing, as they believe, superior virtue, is used as a lotion; next some herb in repute (perhaps the plaintain) is well impregnated with saliva, by chewing it; with which, in form of poultice, they cover the sores. Nor is it unfrequent even to employ the dog in their simple surgery, being persuaded of some healing balsam adhering to his tongue.^r

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^r In other countries similar virtues have been attributed to the dog's saliva. We find in the parable of Dives and Lazarus the notion to be common in Judea many centuries ago; and "moreover the dogs came and licked his sores." In this lesson, conveying useful and obvious morality, the dog is introduced supplying, by the balsamic saliva of his tongue, that curative relief which the rich man neglected to

With respect to preventatives, I have nothing new in this stage, as a remedy, to propose; no boasted *specific*, with which I would wish to amuse the reader. Instead of this, my principle aim is to descry all *panaceas*, the *inanis jactantia multorum specificorum*, as Boerhaave justly files them; and to turn the patient's attention to more rational prophylactics. If credulity can be removed, and one or more of the means proposed be diligently executed, life may be preserved, which evidently must be sacrificed should the empiric or the empiric's nostrum continue to possess the patient's confidence.^s To be sensible of our ignorance, to be convinced that we have hitherto acted wrong, is one step towards acting right, and towards knowledge, since we then only turn our thoughts to another direction, in search of what we want. He that can remove an error in so essential a point as what we have been considering, though he may not be able to supply a remedy, may be the indirect agent towards its accomplishment, in as far as it opens a field for investigators who may be more fortunate in their researches.

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Nothing

to offer to the afflicted pauper at his gate. Vid. Saint Luke's Gospel, chap. xvi. ver. 19.

^s Vid. App. Fatal case near Yarmouth, in spring 1796.

Nothing is so fatal in medicine as blind security; nor should we pronounce any species of disease incurable. All we have a right to say is, that we cannot accomplish it: for though the present and antecedent ages have failed in finding a remedy, we act rashly in concluding the same of succeeding generations. The mind is progressive, and the knowledge of one link in the great chain of cause and effect, serves as a key to the next; this again to another, &c. A disease may arrive to such a point, that from viewing the ravages it has already made in various parts of the machine, and the comparative strength of the whole, we may justly, and with little hesitation, conclude it incurable in that particular individual; but, at a certain time of the disease, our conclusions ought to have been very different. I am unwilling to call any disease, to which the human body is liable, not even Hydrophobia itself, absolutely beyond the reach of medicine. This notion would increase indolence, and put a fatal stop to an industrious search after knowledge. I may, however, give it as my own opinion, that no real case of Hydrophobia, well authenticated, has to this day ever been cured. I read of many cures, but I doubt their authenticity, i. e. I doubt whether the disease arising from the bite of a rabid animal

mal really existed in those persons on whom the cures are said to be performed. Imagination is powerful over the human frame; the mind, which operates on the body, may be equally elevated or depressed by it, according to existing circumstances. This fact is well known, and needs no illustration. In applying this observation to our subject, we must recognize the dreadful effects of fear, as one of the most frequent causes introducing a disease so nearly resembling the complaint under consideration, that the diagnostic has eluded the search of men of great medical sagacity; and they frequently describe diseases as if they were rabidly hydrophobic, where the body was solely under the power of this passion. The limits I wish to prescribe to these pages will not allow me to enter more minutely on the subject of specifics; and nothing more, I presume, is necessary on the head of preventatives. I shall proceed then to lay before the reader the leading symptoms characterizing the complaint in the human species.

SYMPTOMS

SYMPTOMS OF THE DISEASE IN THE HUMAN SPECIES.

The disease which is the consequence of the bite comes next to be considered. This need not be done at any great length, as almost every case forms a complete history.[†] Symptoms *merely* shall be enumerated.

All disputes shall be passed over relative to the antiquity of the malady. It becomes of little real moment, whether Hydrophobia from rabid infection was observed in the days of Aesclepiades, as le Clerc alledges; or was known in the time of Homer, as Celsus Aurelianus labours, by quotations from the Illiad, to prove.

In the course of the last *eight* or *nine* centuries several new diseases have arisen; and it is remarkable, that they are not only all infectious, but can be communicated by no other method than by infection, as far as our experience reaches. I do not mean by this to place Hydrophobia among diseases of recent date, or only communicable by infection. There is some reason to conclude differently with respect to it. To doubt the infectious nature of the canine poison would be to doubt the clearest evidence, and hence

[†] Vid. Appendix.

hence it comes to pass that it arises at all seasons, and in every climate. When the malady manifests itself, the symptoms vary in various subjects, according to constitution, &c. but this is no more than what takes place in other diseases. The pathognomonic and peculiar symptoms are but few.

The symptom Hydrophobia (dread of liquids) has been considered by some as its characteristic mark; by others denied; but as it is found in some diseases, which cannot date their origin from rabid infection, Hydrophobia is not pathognomonic; yet the disease may still retain the name as before, for difficult deglutition being present, less or more, almost in every case, the impropriety of the name is less.^v

I first saw this disease when a boy, and though not then conversant with medical subjects, it arrested my attention in a more than ordinary manner. The horrors, the tremours, the convulsions of the breast, throat, eyes, and the whole upper parts of the body, at the approach of the cup; the hasty manner its contents were thrown into the mouth, when the patient had resolution enough to attempt to swallow; with the scene that immediately followed, made an impression not to be effaced.

Suppose

^v Exceptions are few.

Suppose then, what too often happens, that the patient has been neglected at the time of the bite, and during the interval between this and the disease, and confidence placed in superstitious incantations; an amulet, or some fashionable prophylactic, and opportunities of applying efficacious means irrecoverably lost, we shall find a malady about to commence little different from common diseases. It first threatens by the usual warnings of sense of coldness, alternating with heat, pandiculation and yawning; and with sometimes a higher degree of exhilaration of spirits.^w These being only the first harbingers, they continue sometimes for three, four, and even to six or seven days before the patient takes the alarm: a severer train of symptoms, but more characteristic, afterwards succeed.

SYMPTOMS.

1. The first is generally a pain in the part where the bite has been received, stretching upwards towards the hip and groin, if in the lower; towards the shoulder and axilla, if in the upper extremities; and sometimes with discolouration: sometimes to the temples, ear, and down to the throat, if about the face or neck. We have quoted examples to prove this. 2.

^w Vid. App. Case by Dr. Girdlestone. "He appeared uncommonly cheerful, distinct, and collected." Mr. Johnson on Hogg's case.

2. Lassitude, inactivity, and torpidness.
3. Disturbed sleep---watchfulness---*muscæ volitantes*.^v
4. Terrifying dreams---illusions.^w
5. Convulsions, especially when offered drink.
6. Starting of the tendons.
7. Perpetual restlessness.
8. Cannot bear a recumbent, especially a supine_x posture.
9. Dejectedness and melancholy, with deep sighing, fear, timidity, and apprehension.^y
10. A desire of solitude.
11. External organs of sensation morbidly acute, the smallest motion of the air, especially cold air, producing great uneasiness.^z
- 12.

^v “ His attention was particularly directed to the flies; why dont you put away those flies? he would cry, and kept striking at them with his hand.” Mr. Babington.

^w “ In the night rushing into his master’s chamber, he declared there were thieves in the house, and that there were others endeavouring to steal horses out of the stable; and pointed to lights, which he swore he saw passing to and fro, and describing the dresses of the people.” Dr. Shadwell. Vid. Mem. Lond. Med. Soc. vol. 3, p. 458.

^x Vid. Dr. Vaughan, Case 1.

^y “ Whatever he wanted to obtain, whether to have some disagreeable object removed, or some request granted, it was implored in the most piteous manner. There was a fierceness displayed, with a mixture of timidity, that I despair of impressing the reader properly with.” Dr. Vaughan.

^z “ The morning was cold, and he complained every now and then of the air suffocating him: he was therefore very intent upon mitigating its coldness, ere it was applied to the
fauces,

12. The light offensive to the sight, and unable to look at a transparent body, such as a mirror, a pool of water, &c.^a unable also to bear the sight of scarlet.

13. Eyes quick and penetrating.^b

14. Great dilatation of the pupil; blindness, sometimes temporary, sometimes continual; and this either of one or both eyes.

15. Smell also diseased.^c

16. Tongue dry, and great thirst.

17.

fauces, by holding a handkerchief constantly to his mouth." Dr. Vaughan. Coelius Aurelianus notices the same.

This symptom is universal, though different in different patients: to all distressing. Some, to avoid the cold air, will walk; others even run backwards up a flight of stairs, with astonishing rapidity, rather than face the draught blowing down.

^a "But a much greater inconvenience arose at the sight of a puddle of water which frequently occurred in the streets, through which he passed in going to the infirmary, and which never failed to produce a dreadful agony. He could look at his own urine in a dark-coloured chamber pot, but could not when put into a glass." Ditto.

^b "The singular appearance of his eyes was very striking, and is, I believe, peculiar to people labouring under the Hydrophobia. The iris had assumed an orange hue." Ditto.

^c Nurse complained of a fœtor in the wound: there was no discharge from it, and it was nearly cicatrized. This must have proceeded from his vitiated smell. "Even the sense of smelling was preternaturally increased." Mr. Johnson on Hogg's case.

17. Pulse unsteady ; weak ; sometimes hard, changing frequently.

18. Aspect likewise various.^d

19. Unusual titilation of the urethra. Urine in small quantity, sometimes forcibly expelled by spasms. After making water, *feminiis emissio*.^e

20.

^d Dr. Fothergill.

^e Both Mead and Lister, as well as later authors, take notice of the *veretri frequens erectio cum seminis involuntario jactu*; as also Cælius Aurelianus. Van Sweiten likewise relates more than one instance of it. Among others he mentions the case of a porter, as given by Hermandes in his Thesaurus, who breathed out his soul, as it is there expressed, for the last three days of his life, in this way; and in Bonetus's Sepulchra Anatomica, the case of an old man of seventy is mentioned, who from the priapism that attended the disease, was urged to converse with his wife. It is observed however, that some of those said to be so affected, had large blisters on them at the time; and it may in part, perhaps, be attributed to the irritation given by them: yet in several cases related to me, this symptom did not occur. Vid. App. Case near Yarmouth, communicated by Dr. Girdlestone.

Satyriasis, as an original disease, has been accompanied with Hydrophobia. Vid. Mem. de la Soc. Roy. de Medicine. A curious dispute was once agitated, as we find by a memoir inserted in this work; whether a person bitten, and in the interval between this and the disease *si rem cum uxore habuerit*, infection would follow? The negative was proved by examples adduced. This uninteresting dispute, neither very decent nor instructive, might have been ended without search after instances to disprove it; had the agitators reflected on the locality of the poison, on the absence as yet of disease, and on the freedom of the fluids from taint.

20. Muscles of the *gula* now convulsed, as soon as water or other liquids touch them, internally or externally.

21. Great sense of suffocation, but seldom pain.

22. Stricture about the *cartilago ensiformis*.

23. Sense of a boiling heat in the stomach.^f

24. Strong palpitations of the heart.

25. In some instances the sensation of flame scorching the external body, especially about the back and belly.^g

26. Copious flow of saliva, viscid and ropy.^h Often excessive reachings to vomit ; not in every case full vomiting.ⁱ

27.

^f Dr. Vaughan.

^g Catherine Champion had the sensation of flames scorching her back and belly, and could not be persuaded to the contrary; desiring the physician to examine and be convinced of its truth. Vid. Mem. de la Soc. Roy. de Medicine. ann. 1783, p. 139.

^h "His spitting of frothy matter increased so much, that in spite of all the care possible, his bed was exceedingly wetted by it." Vid. Lond. Med. Obs. and Inq. p. 356.

ⁱ "My own patient, even under the large doses of oil, never had the least disposition to vomit." Dr. Girdlestone's letter to the author, Feb. 24, 1797.

"Respecting the state of the stomach of Jeremiah Groves, while under Hydrophobia, as far as I recollect, there was neither sickness nor vomiting during the whole course of the disease." Dr. Maclean's letter to the author. Jan. 26, 1798.

27. As the disease advances the spasms of the cremaster muscle cease. Eyes now lose their penetrating appearance, becoming more fixed and heavy.

28. The disease still advancing, pain from swallowing increases; and liquids in many, though not in every instance, totally refused.^k

29. Pulse intermits---hands and feet become cold.

30. The paroxysms of the convulsions return now at shorter, but uncertain intervals---become more violent. *Risus sardonius*.^l

31. Now constant muttering and talking; yet when questions are asked, rational answers given.^m

32. Pulse now more frequent; at length constant delirium, horror, and the extremest anxiety.

P 33.

^k Vid. two cases where liquids were not refused. Mem. de la Soc. Roy. de Medicine. ann. 1783.

^l Dr. Vaughan.

^m Dr. Wolf, of Warsaw, in describing five hydrophobics to Henry Baker, F. R. S. gives the following picture. It is indeed melancholy in the extreme. "None of them quite lost their right senses; but they were all talking, without intermission; praying, lamenting, despairing, curling, fighting, spitting a frothy saliva; screeching, sometimes belching; reaching, but rarely vomiting."

33. Frantic ; and attempts, sometimes in the fit, to bite ; but this not frequent.ⁿ

34. Spasmodic affections still increasing, sometimes become so strong as to throw the patient out of bed, if not forcibly held in it.

35. Death. This takes place variously ; not unfrequently as if strangled with a cord :^o sometimes placidly, and without the least struggle ; and sometimes even with a smile on the countenance.^p

Dr. Lister adds, in the history of a patient under the disease, “ he had a violent fever on him.” This was on the morning he died : but fever is not a common symptom, especially in the early part of the complaint. In Master Rowley’s case “ considerable fever” was present : he complained greatly of a pain in his head, and of great thirst : his pulse was very quick, full, and hard. The wound became painful before the disease appeared : a pain in the right ear
first

ⁿ “ Upon my asking him whether he had any propensity to bite ? he replied negatively, in a very plaintive tone.” Dr. Vaughan.

^o Race’s sense of suffocation increased as he came nearer his end. Vid. Appendix, vol. 2.

^p “ He fell back in the bed, and died with a countenance as much opposed to that of the minute before, as it is possible to conceive ; the scene being closed with several of the most beautiful smiles.” Mr. Babington on Palmer’s case.

first announced indisposition. This is a very early symptom, and it was therefore particularly marked out under the head of prevention, as a reason for presuming the poison local till this time; and that excision might succeed if then performed.

In the old woman's case, who died at Edinburgh, the first symptom was great pain in the cicatrix of the fore, stretching up her arm. This was succeeded by shivering, followed by heat and thirst, nausea, and other febrile symptoms.

In Dr. Vaughan's first patient, a pain in the bitten part was the first symptom. In his second case, a pain was likewise felt in the bitten part, which was the wrist, extending up the arm, and even affecting the temple of that side of his head. In his third case, a boy eight years old, a pain in the bitten part, extending up the hand and arm, was also the first symptom.

In Dr. Berkenhout's patient a similar pain in the bitten part preceded the disease. Dr. James notices the same occurrence. Cœlius Aurelianus also mentions it.

Two of the four persons bitten by the mad wolf, as related by Default, had their cicatrices inflamed and painful, and hard about the base, rising like embroidery, at the commencement of the disease.

In Knipe's case,^a pain in the bitten part, extending up the hand and arm, was the first symptom. Morgagni, from the cases he has collected, could not avoid noticing the same, and for this reason advises the excision of the cicatrix when it begins to itch, and pains to shoot from it, with change of colour in the part. Hence it is evident, that the re-inflammation of the wound is a common occurrence, and noted by most who had seen the disease.

It is curious to observe, that the muscular strength is little impaired in this malady,^r nor do the lungs partake much of the disease. Patients can run, and are even relieved by this exercise, though violent. This, however, must not be denominated real strength; it is the last exertions only of worn-out excitement; for debility and death soon follow.

It has been doubted by some, whether a great torpidity is not induced on the nerves, and muscular coat of the stomach, by the rabid virus preventing stimulating substances from their usual effects; and instances are adduced for the purpose of establishing this fact. A case is brought forward of a patient, only eight years old, where
so

^a Vid. Appendix, vol. 2.

^r Vid. Transf. for Improv. of Med. and Surg. Knowl. Case of a boy running. Alò Morgagni de caus. et sedib. morb. Case of a boy at Bologna.

so large a dose as *two* grains of cupr. ammon. were administered not only without vomiting, but without the least nausea or sickness; though this quantity, it is alledged, would have severely vomited an adult, or a person in whom this organ suffered a less degree of irritation.^r

If the author had in view, as might probably be the case, Dr. Vaughan's patient, a child eight years old, the whole is not told: for the doctor added to the cupr. ammon. an equal quantity of extr. thebaic; and added also, in clyster, a dram of the tinct. theb. with a view, no doubt, of preventing this effect. It was the virtues of strong tonics in Hydrophobia, which he wished to discover; and to prevent the stomach from rejecting the medicine, the opiate was conjoined.^s

The following instances however, though a few only of what might have been collected, are

P 3 sufficient

^r Vid. Encyclop. edit. Edinb. Art. Hydrophobia.

^s "Each dose of his pills were directed to contain two grains of cupr. ammon. the same quantity of theban. extract, three grains of flor. zinc, with ten grains of asafætida; whilst a solution of that fætid gum, with a dram of tinct. thebaic, was administered as a clyster. The above pills, though repeated every four hours, afforded not the smallest relief; nor did they shew the least action upon the frame." Dr. Vaughan's 3d Case, page 33.

I find no other case recorded, where this medicine is given in the same quantity.

sufficient to prove the irritability of this organ under the complaint, and the propriety of our noticing vomiting as a symptom.

1. Dr. Raymond's patient, Boyer, "vomited now and then, with violence, a glairy matter, little in quantity, and which made him shudder." This happened at Marseilles.

2. The slave boy, attended by Dr. Gray, "had continual efforts to vomit, but without effect, from ten in the morning till four in the afternoon, when he died." This was in the East Indies.

3. Dr. Shadwell's patient, Wyburn, "complained of a great stoppage in the throat, and load at his stomach; and said he could vomit, if carried into the air." This was at Brentwood. This indeed is not absolute vomiting, but sufficiently proves the irritability of the stomach.

4. Race took medicines on the second day of his illness, "and he kept them down but a short time; for he had now a constant vomiting." Two days after this, having taken a powder in water, "he vomited it up soon after." This happened at Stowmarket.

5. The lad Brown, Dr. Dickson's patient, "vomited frequently. Some hours before he complained of hunger, and ate an apple greedily,

symptom," not in the beginning, but in the progress of the disease. The physician had not left him an hour before he was taken with frequent "vomiting, reachings, and constantly spitting a viscid phlegm. This came on before he took the turpith pills." Still farther in the progress, and near its determination, he is on the bed, "speechless, groaning, foaming at the mouth, now and then vomiting a dark brown choler."

10. The boy, whose case is related by M. de la Pryme, "vomited a matter like black blood, which stunk like fallad oil, but much worse."

11. Mr. Bathie's patient, James Patton, "was *inclined* to vomit, but was afraid to do so for the obstruction in his throat."

12. The lad, Palmer, was very irritable at stomach; for he vomited up the first bolus given him, soon after swallowing it. He vomited another bolus sometime after. About two days afterwards, as the disease advanced, "he made frequent efforts to vomit." At another time opiate pills were given. "These, however, staid down but a short time, and a second and third which were given him came up almost instantaneously." Still nearer his end, attempting to swallow bread and butter, "it was thrown from his mouth, together with a quantity of glairy fluid he had been *vomiting* all the morning."

13. Dr. Vaughan's second patient was severely affected with irritability of stomach; for "in the evening he was seized with a vomiting, which continued the whole night, and until eleven o'clock the next day, every thing coming up as soon as taken."

14. Johnson, Dr. Ferriar's patient, swallowed his medicines tolerably well; but as the disease advanced, in the doctor's presence, "he reached several times, and threw off some wind. At a quarter past ten the same day, he swallowed some of his mixture, and immediately threw it up again."

15. Mr. Sabatier's patient, on the second day after he was taken ill, "had a desire to vomit."

16. Mary Strong, "a little before her death vomited about a pint of something like blood coagulated." Had two grains of cupr. ammon, though mixed with opium, been given, it would appear from the irritability discoverable, that these patients would have all vomited from it.

17. The man who died in 1782, in the Middlesex Hospital, was affected with vomiting.

18. Gervais Briquet vomited in the beginning of the disease some black matter, with some wine he had taken just before. On the 10th day from the attack he vomited a large quantity of brown and black matter, which was thrown with such
force

force, as to strike the foot of the bed. Died an hour and half after.^t

19. Catherine Champion also vomited.^u

20. The Sieur Granan had nausea, and an inclination to vomit, ejecting some glairy matter on the second day of the disease; also continual efforts to vomit. During the same night discharged nearly a gallon of a thick glairy matter. It continued till twelve next day.^v

21. The man-cook vomited the second day of the disease. It returned also the succeeding evening, when he vomited throughout the whole night.^w

22. Castinel vomited two days before his death.^x

23. The advocate vomited a quantity of black blood.^y

24. Another patient, mentioned in the same work, vomited the day before death.

25. Metzler was called to a hydrophobic, where constant vomiting for a considerable time took place.^a

26. George Pollock, "immediately after drinking, sweats about the head and breast, with vehement efforts to vomit. Three hours after,
con-

^t Vid. Mem. de la Soc. Roy. de Medicine, ann. 1783.

^{u, v, w, x, y, z, a,} Ibid.

convulsive motions, with deep sighings; and after these reachings and vomiting." Thirteen hours after this. "These efforts to drink always produce belchings and reachings to vomit." ^b

27. One of Dr. Wolf's patients, who had forced down a large quantity of drink, vomited more than fifty times in consequence, ejecting by this operation an abundance of frothy slime. ^c

28. Nourse's patient, Stephen Bellas, was affected with vomiting.

29. Francis Tweed vomited.

30. In Macey's case we find activity in stomach and in gastric juice; for a few minutes after he drank some milk, and but a few hours before his death, "it regurgitated in a state of *partial* coagulation, and mixed with a fluid of a cineritious colour." ^d

From the history of the disease it is evident, that the symptom Hydrophobia is not the commencement, but rather a middle point in the malady. Being the most distressing, the previous small deviations from health are often overlooked, and difficult deglutition first arrests the
attention,

^b Vid. Mem. Lond. Med. Soc. vol. 1, p. 243.

^c Vid. Encyclo. Brit. Edinb. vol. 11, p. 278.

^d Mr. Haighton's case.

attention, and creates the alarm. I would wish particularly to draw the medical reader's attention to this circumstance; it will assist him in forming his prognostic; for after its appearance, not an instance is to be found of recovery; every paroxysm collecting more strength, death hurries on apace.

Authors, at an average, have placed this event about the fourth day; and it does not appear, from the following instances, that they were greatly mistaken.

Mr. Bellamy became affected with the first symptoms, i. e. Hydrophobia, on the 13th, and died on the 17th.

Abraham Palmer felt some symptoms on the 17th, and died the third day after.

John Brown fell ill on the 30th of April, and died the fourth day after.

The gardener's servant continued well till the 28th of April, and died the 1st of May.

Mary Strong died four days after Hydrophobia appeared.

Master Rowley became affected on the 11th, and died on the 13th.

The French woman, bitten at the same time, was taken ill on the Friday, and died on Tuesday following.

Christie

Christie came to the Edinburgh Infirmary under Hydrophobia. She died the second day after.

Dr. Mead's first patient became hydrophobic the 22d, and died the 24th.

His second became affected on the 8th, and died on the 11th.

His third continued three days from the time he was affected

Dr. Munckley's patient fell ill on the 19th, and died on the 21st.

The girl Niece died the third day from the commencement of Hydrophobia.

James Patten became affected on the 9th, and died on the 12th.

William Knipe became affected on Monday, and died on the Thursday following.

Dr. Vaughan's first patient began to complain on Sunday, and the succeeding Wednesday died.

His second became affected on the 6th of June, and died in about 48 hours.

His third died four days after the first symptom.

Mr. Sabatier's patient, the gardener, died in two days from the commencement of Hydrophobia.

His second patient died in 24 hours from the first attack.

Dr,

Dr. Ferriar's patient continued to the 6th day.

Mr. Scruton's patient felt difficult deglutition on the 27th, and died on the 29th.

The old woman at Edinburgh, bitten in 1792, was seized on the 13th, and died on the 17th.

George Cobb died two days after Hydrophobia appeared.

John Slight died thirty-nine hours and a half after the first appearance of difficult deglutition.

Dr. Gray's patient died two days from the commencement of Hydrophobia.

These instances may suffice to prove the rapid progress of death, from the commencement of Hydrophobia.

Observation has already taught us, in two cases at least,^d that the disease in the dog occupies nearly the same period as in man.

A similar relation is discovered in the distance intervening from the bite to the first symptom. Though three weeks be not a frequent interval in the human species, yet it is an occurrence happening in more than one or two solitary instances,^e and this period is not unfrequent among the inferior tribes.

Dr. White mentions some animals bitten and infected, "which were all dead within the month."

^d Vid. p. 23. ^e Vid. Table of distance from bite, &c.

month.”^f A cow, some swine, and other animals, bitten by a mad fox, died in three weeks.

M. Bonel likewise mentions the death of five animals, viz. a dog, a cat, a bull, and two cows, none of which survived more than three weeks from the bite. The cows lived after the commencement of the disease four days; the bull not quite so long; the dog three days, and the cat thirty hours.

Dr. Guthrie notices two dogs bitten at the same time with his patient, which died mad one month after.

A dog mentioned in this work, wormed when a puppy, contracted madness, and bit several dogs, two of which went mad about 20 days after.^g

The puppy, whose case is described in page 23, died on the 21st day.

On the whole, however taking a number of cases together, the disease will be found to appear earlier in the inferior order of animals, than in the human species; and a train of spasmodic symptoms

^f Vid. Mease on Bite of Mad Dog. App. edit. Lond.

^g Vid. Chapter on Worming, vol. 2.

symptoms mark the complaint in our domestic animals as well as in man.^h

The dog bitten at the same time with Mr. Foot's patientⁱ died on the 14th day after.

Dr. Western mentions two sheep, bitten in Jamaica, which were dead in ten days.

Col. Nixon relates an instance of a dog bitten in the East Indies, which died in ten days.

Mr. Meynell has observed the disease occur in fourteen days.

Dr. Shadwell noticed the appearance of the disease in a pig nine days after the bite.^k

Dr. Dickson takes notice of a dog bitten on the same day with his patient, which shewed signs of madness on the 7th.

These instances, taken without selection, will serve as proofs of the above observation.

Though the disease cannot be marked by a stage commencing with a dread of water, a symptom which the dog does not discover, yet there is a period when he loses his recollection, which distin-

^h Dr. Shadwell relates a wonderful instance of spasmodic affections in a pig under the disease. It leaped from the ground to the height of 12 feet. Vid. Mem. Lond. Med. Soc. vol. 3.

ⁱ Vid. Med. Facts, vol. 3, p. 33.

^k Vid. Mem. Lond. Med. Soc. vol. 3.

distinguishes the boundary of a first from a second stage. If he is chained, his howlings are of the most melancholy and distressing kind, far different from the fretful barking of a confined dog in health. About two days of howling and fury generally terminate the scene.

With respect to the disease in the human subject, difficult deglutition marks the commencement of the second stage. After this has taken place no human means have been able to save life. Medicines cannot, in many cases, be at all swallowed: in those where the efforts of the patient have prevailed, and they have reached the stomach, they are either rejected, as we have seen, by vomiting, or become ineffectual from the power of the virus over that organ.

The gradual approach of the first stage towards the second, affords a better opportunity of trying the effects of medicines. This most important period is however unfortunately neglected; its warnings are either taken for a common cold, or some more trivial complaint: even Hydrophobia at first is considered as such, and for a day or so the patient is willing to indulge himself with this hope. But viewing the disease as above, the first approaches must be narrowly watched, if expectations of success are to be entertained. This is the moment which is pre-

cious ; this is the time the physician must apply with all his energy, and with all his judgement his remedies.

In order to arrive at a better knowledge of the pathology, and a better explanation of several phenomena in the history of the disease, it will be proper to lay before the reader a few of the particulars which Dissection has enabled us to discover.

DISSECTIONS.

DISSECTIONS.

BEFORE our own times I find no examination of human subjects perishing under this malady. Morgagni says, that prior to him there had been none attempted, except one by Cappivacci, his countryman. This must, doubtless, have arisen from the dread entertained of the infectious nature of the disease. It was universally believed, that man infected man, and that animals, of whatever species, infected animals of every species.

Stalpart had his mind so impressed with the possibility of man's communicating the disease, that in the instances where he had occasion to feel an hydrophobic's pulse, he immediately after washed his hands.

Themison likewise, under the same impulse, thought himself infected after visiting a patient under Hydrophobia. He imagined his deglutition already impeded. He recovered from this

dread, and asserted he had accomplished a cure on himself.

During the prevalence of these opinions, we need not wonder if attempts towards an investigation of hydrophobic cadavera should be made with caution and irresolution when made at all. Hence the dissections, few as they are, exhibit such unsatisfactory marks. Appearances viewed in haste, and with trepidation, cannot be described with accuracy: examinations are generally undertaken also at too great a distance from death to discover the real effects of the disease.

If the human species be incapable of communicating the disease when alive, and little doubt remains of this fact,^k the terror of inspecting the bodies of hydrophobics must vanish. An instance or two has been mentioned of a small scratch or abrasion of cuticle speedily becoming inflamed and festering after dissection; and the pain has been spoken of as extremely acute, alarming the operator, but no serious evil followed. Provided however, it had been otherwise, Hydrophobia would not have been the complaint, but in all probability a putrid disease. Fevers have arisen from prosecuting dissections, speedily inducing death.

From

^k Vid. vol. 2, under the head Hydrophobia, not Madness.

From what has been said we may look in vain for accuracy among the generality of dissections recorded by authors. They present indeed many deviations from the sound subject; but in a disease where convulsions form so characteristic a part, the injuries sustained must be in proportion.

Morgagni details only a few dissections, but enumerates a considerable number. He was a man of great reading, and a skilful anatomist; yet in the only two cases where an opportunity was offered him of instructing mankind, by his own examination, his private affairs deprived the world of his labours, and they were entrusted to his friend Mediavia. In collecting dissections he found a variety of appearances described, and no two cases were the same. He declines, therefore, drawing conclusions concerning the seat of the disease. Speedy putrefaction, however, seemed common to all.

He mentions one made 24 hours after death:¹ it was indeed in the hottest season of the year. The neck was tinged with a livid colour, though the rest of the body did not smell greatly. In this example the vessels of the stomach were as much distended with blood, as if injected: it

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¹ Vid. Morgagni, Epist. 8, 26.

contained a fluid of a yellow greenish colour. A considerable part of the liver was livid; the gall bladder full of bile of a brown colour. Some marks of inflammation were observable on the diaphragm. The lungs extremely turgid with blood; swelled, but not hard, and of a black appearance. The blood throughout the body congealed, black, but not of a firm consistence. The top of the œsophagus, as well as the pharynx to which it was connected, was of a blackish red colour, tending to a gangrene, as were the larynx and aspera arteria; but no mark of disease appeared in the lower part of the œsophagus connected with the stomach. A green and yellowish foam stuffed the pharynx, the posterior opening of the nose, and thickly covered the roof of the mouth.

The blood vessels running through the meninges of the brain, much distended: the substance of the brain itself every where distinguished by bloody points, and a kind of bloody filaments. The lateral ventricles contained a small quantity of reddish serum. It is added, that this man was delirious; kept continually crying out, and laboured at the same time under fever.

Another

Another patient was opened 16 hours from death;^m and though in a cold time of the year for that climate, yet the body was in a putrid condition, and smelt so offensively, that they were obliged to separate the head and thoracic viscera, and inspect them in the open air.

The lungs were black, and smelt strongly. The right auricle of the heart was greatly dilated, not from the blood it contained, but from air: the left much contracted; and in the ventricles were thin polypous concretions.

The vessels of the dura mater contained similar concretions, but of a loose consistence. Some bubbles of air were observed under this membrane. The vessels of the brain were every where distended with blood; and the choroid plexus so full, that it appeared black, without extravasation of serum.

The substances of the cerebrum and cerebellum were rather dry than moist. The putrefaction prevented the inspection from being farther carried on. They observed in general, however, that the blood was rather concreted than dissolved. The material parts, i. e. the œsophagus and stomach, were left unexamined; and the dissection without them proves of little use.

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^m Vid. Morgagni, Epist. 8, 23.

They shew indeed marks of previous derangement, but whether to be attributed to the agitation of mind, the concomitant convulsions, or mode of treatment, or to the whole combined, is a question.

This patient was bitten some months before, and during the disease was perfectly rational. He was very roughly treated, both by the pouring of water in abundance on his head, and then forcibly plunging him into the cold bath, where he was held till, as it is said, he drank water, but rather till he was nearly drowned. He lived about a day after. The reader may easily suppose, that the means used for his relief, greatly agitated his body, changed the mode of circulation, and induced part at least of the appearances, both of the brain and lungs. He mentions a woman likewise, whose body was entirely putrid within 15 hours after death, and this even in the middle of winter.ⁿ

Morando Morandi^o found the stomach and intestines, in two cases “affected with a gangrene, and daubed over with a black and fœtid bile.”

Senac saw the “pericardium so constricted and annexed to the surface of the heart, in a man
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ⁿ Vid. Morgagni, Epist. 8, 31.

^o Ibid, Epist. 61, 9.

who died of dog-madness, that it could not be separated therefrom.”^p

Zwingerus^q assures us of the blood being concreted in the heart and large vessels, and that the intestines moreover, but especially the stomach, were distinguished with red spots.

Brechtfeld observes of a dissection which he is describing, that “the right auricle of the heart was amazingly swelled: the right ventricle was full of grumous blood, and in the left was a blood altogether fluid.”

Without knowing more of the case than this observation contains, our conclusions must be imperfect. Taking it as here presented putrefaction is proved.

In the case of a man of sixty, described by Morgagni,^r the appearances were: 1st. Intestines much distended with air, but otherwise nearly empty. 2nd. The stomach contained a small quantity of an ash-coloured thickish, not viscid fluid. 3d. The gall bladder contained a small quantity of highly yellow bile, by which the duodenum, and contiguous portion of the liver were stained. 4th. “The iliac veins were so turgid with blood, that they equalled the natural

^p Vid. Morgagni, Epist. 61. 9. ^q Ibid, Epist. 8, 20.

^r Ibid, Epist. 8, 27.

tural diameter of a small intestine ; but their corresponding arteries were utterly empty." 5th. The lungs were stuffed with blood, as if the crassamentum of the whole blood of the body had been collected there. The back part might be pronounced in a state of gangrene. 6th. The pericardium contained about three ounces of a yellowish fluid. 7th. The heart contained a small quantity of blood resembling half-melted pitch. 8th. The vena azygos contained a very small portion of blood. 9th. The internal carotid arteries and jugular veins were entirely empty. 10th. The organs of deglutition were free from inflammation, except a slight redness on the top of the pharynx ; but the membrane surrounding the epiglottis was shrivelled and crisp. 11th. The vessels of the meninges were greatly distended with black blood. 12th. The optic nerves were more than usually flaccid, and somewhat thickened. 13th. The cerebrum and cerebellum appeared healthy. 14th. The ventricles of the brain contained about three ounces of a yellowish fluid. 15th. The thoracic and abdominal viscera were unchanged.

It appears doubtful whether this was a case of rabid Hydrophobia. The man indeed was bitten about three months before by a rabid animal ; but about twenty days preceding his death he

he was thrown into violent agitation by a threatened beating. Till then he was in perfect health; but from this till the time he entered the hospital with difficult deglutition and dread of water, only two days before his death, he became uncommonly fearful and timid; shunning every one, and hiding himself whenever he could from notice. If it is to be termed Hydrophobia, it belongs to the spontaneous, not to the inoculated species. We have no case of the latter, where twenty days intervene from the first appearance till death. When it is compared with some which shall be mentioned as spontaneous, the similitude will be found nearly exact.

This patient is represented to be of a choleric and sanguineous, though robust habit. All the appearances presented in the dissection proved great derangement of the functions, and irregularity in the distribution of the fluids. A dropy both of the brain and pericardium was present. The case resembled, on the whole, Boerhaave's idea of Hydrophobia, *morbis summé inflammatorius*. The salival discharge was neither ropy, nor in great quantity. He spat often, it is observed; but the spittle was fluid. He had no foam about his mouth.

To constitute a rabid disease it is not sufficient that the complaint should arise within the
limited

limited time prescribed to rabid infection; for infection might not have followed *that* bite. The disease must have all the intrinsic marks to constitute it of the rabid class: inflammatory symptoms do not belong to it.

Morgagni observes of the cases then under his consideration, that “as there are many things in which these patients while living differ one from the other; so there are not fewer, but even more, in which their bodies differ after death.” To demonstrate this he brings together a great variety of morbid appearances observed in the different parts, classing them under distinct heads, beginning externally and proceeding to the internal organs.

It is by no means clear, that in this large collection of dissections the patients were all affected with rabid Hydrophobia. Marks of putrefaction were very evident in many of them, both on the external, and in the internal parts. In three cases the lividness on the external body was almost universal. It was discoverable on the neck, shoulders, back, and fingers. The stomach was found, in another case, distended with air, and its vessels turgid with blood. In another its internal coat corrupted (perhaps ulcered or sphacelated) and in others again dotted with red spots. The intestines were, in three instances, distended with

with air; and in a fourth sprinkled with red spots, distinct from each other.

He mentions ten instances in this recapitulation, where the lungs were stuffed with blood, sometimes black, and always with marks of inflammation. Whether they were hydrophobics contracted from rabies, the reader, on comparing the originals, must judge. He collected his observations with great industry, yet delivered for the most part

“ The total grist, unsifted, husks and all.”,

He judged, doubtless, this the safest method, as it left the mind at liberty to adopt or reject, according to the point of view in which they were seen. He likewise entertained the notion prevalent not only in his days, but with the ancients, and with many even at present, of the possibility of the disease remaining latent for twenty, forty, or even a greater number of years, and then appearing. This would lead him from the consideration of distinction of hydrophobic and tetanic affections; presuming when the complaint arose, that it must proceed from the bite, if any could be traced, how distant soever it had been received.

In

In five instances of diseased pericardium, one was dropfical; two with no fluid whatever; another with a very little only; and the last in a great degree dry and friable.

In several instances of diseased heart, the appearances were likewise various: now the cavities were extended with air; now contracted and dry: now flaccid, sometimes with small polypi: once distended with blood, as we have seen like melted pitch; and one where the right ventricle was full of grumous blood, while the left contained it altogether fluid.

The œsophagus likewise, in different cases, presents different appearances. Here it is marked with some inflammation; there no morbid appearance is discoverable.

The same variety was found in comparing the brain in different cases; but the reader is referred to the work itself.^t

Dr. James does not give his remarks on the affection of the stomach from his own observation; his authority is nothing more, therefore, than a re-echo from others. He likewise notices the offensiveness of the matter vomited by hydrophobics, which would seem to imply disease of the stomach.

Dr.

^r Vid. Morgagni, Epist. 8.

Dr. Mead relates three cases of Hydrophobia; and in one of them, which was opened twenty hours after death, he adds “ We examined the brain, throat, breast, and stomach; but met with no extraordinary appearance any where, excepting that there was a great quantity of greenish viscid bile in the stomach.” This is the whole account given.

The third case, sent him from Stamford, has the following particulars: Fauces much inflamed; left lobe of the lungs black, with the vesicles full of black blood; blisters appeared in some parts of them, as if raised with cantharides. The liver was hard, and of a yellow bilious colour.

Dr. Vaughan was permitted to open two of the three patients whom he attended. In the first nothing preternatural was observable, either in the stomach or œsophagus; nor in the contents of the abdomen, which could lead to any conclusions respecting the nature of the disease: neither did the second show any morbid appearance.

Gallet Dupleffis^a relates the dissection of a hydrophobic; but it appears not to have been made with much accuracy, as the stomach is left unnoticed.

^a Vid. Mem. de la Soc. Roy. de Med. ann. 1783, part 2.

noticed. The condition of the heart indeed points out disease: the left side of this organ was shrunk and soft; and the auricle contained black and grumous blood. The other side was in its natural state.

Dr. Mignot de Genety^v inspected a case, wherein he found some inflammation of the trachea. Marks of disease appeared in the intestines and stomach, where a number of lumbrici were discovered.

Briquet was opened; but not till three days after death.^w Appearances at so late an examination cannot be depended on; they teach nothing.

Catherine Champion was also opened.^x Here the stomach presented distinct dots; and the inner coat was numerously sprinkled with them near the fundus of the great curvature; while some of a smaller kind were observed in the intestines. Some turgescence appeared in the blood vessels of the brain; but the ventricles were free from water.

Sieur Gravan was examined sixteen hours after death. The stomach was found similarly dotted with red spots. Near the pylorus it was soft,
as

^v Vid. Mem. de la Soc. Roy. de Med. ann. 1783, part 2.

^{w, x,} Ibid.

as if macerated, and this approach towards sphacelation was more distinct in the duodenum. The aorta in this case contained a very large quantity of blood, nearly fluid, and of a black colour. The venous blood was of the same quality. On opening the head, the blood vessels appeared turgid, especially in the longitudinal sinus. A considerable quantity of water was found in the ventricles.

Whether this dropsy of the head was in consequence of the convulsions, or of the poison, I shall leave to others to determine. In the pericardium no serum. The right lung was found somewhat shrunk; but no inflammation was discoverable either in the larynx, pharynx, or œsophagus.

In Dr. Bensell's patient (the girl Niece) a disease of the stomach would seem to have been indicated by the matter thrown up. Little vomiting indeed appeared in this case; but that little, it is added, was *tinged* with blood. The quantity of saliva was but trifling in the first period of her illness, but it increased as the disease advanced. It seemed indeed to be phlegm collected deep in the throat, and the consequence of secretions in these parts.

One of the most instructive dissections with which the public has yet been presented, was

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made

made by Dr. Ferriar, in 1791.^y The principal appearances are as follow: They confirm some of the preceding observations. The inflammation in the stomach has been supposed to arise from the action of the gastric juice. I would refer it, however, solely to the action of the poison.

Brain---A preternatural distention of the pia mater in both hemispheres, with a limpid fluid. The quantity of water in the lateral ventricles of the basis of the brain, and round the spinal marrow, somewhat unusual.

Lungs---Sound, excepting one slight adhesion at the posterior part of the left lobe.

Trachea---This was perfectly found.

Pericardium---This adhered pretty firmly to the heart in its whole compass.

No external marks of disease on the stomach or intestines; but on opening the œsophagus, a morbid appearance presented.

The epidermis of the œsophagus, about two inches above the cardia, was abraded in irregular points, and an inflamed surface of a darker colour appeared. Lower down the abrasions became linear, and extended into the stomach itself.

The

The edges of the epidermis surrounding the abrasions, were unequal and elevated. This appearance could be traced along the upper curvature of the stomach, becoming fainter as it approached the pylorus, about which it seemed to terminate.

The whole inflamed parts bore a striated appearance, darkest at the œsophagus, and lightest and less distinct towards the pylorus. The stomach was half full of a dark-coloured fluid, smelling strongly of musk ; a medicine which had been administered. It is remarkable, that this patient swallowed, with tolerable facility, the liquids presented some time before death.

All the other viscera were found. This inspection was made only four hours and a half after death. Hence the abrasions, as the doctor says, may be fairly attributed to the disease. This will account for the irritability of the throat, and its sensibility to cold air, cold water, and to liquids in general ; for the dread of water is nothing more than the symptom.

Here we may suppose accuracy of examination, made at a period so near death, that all suspicion of change from putrefaction must be removed. A number of dissections were com-

municated some years ago to a society,^z whose object was the investigation of this disease. They have not thought proper, however, to detail them; but contented themselves by merely giving the result in this observation: “An appearance has in general been seen on the inner coats of the stomach, near the cardia, similar to what is found in the bodies of persons who have had slight inflammation, that is, a greater number of red vessels, with small streaks of red blood.” They observe likewise, a slight watery effusion on the surface of the brain, with some increase of vascularity in the pia mater.

An account of the inspection of some dogs dead of the disease, was likewise added, and the same abrasions of surface in the form of linear points were detected in the œsophagus and stomach. From this we may conclude, that these are peculiar to animals, of whatever species, dying of this affection; and that the exceptions noticed by Morgagni, Vaughan, and some others, are too few to destroy the force of this general observation.

Inattention may have overlooked them in some instances, and in others, where more accuracy was

^z Vid. Transf. of a Soc. for the Impr. of Med. and Chirurgical Knowledge.

than by presuming a want of distinction of real cases, and attributing, at least in part, to this, what belongs to other complaints.

I shall reserve the insertion of several dissections to a future part of this work.^b What will be found there do not however differ in many respects from these just considered. Putrefaction we find is fully established as an early occurrence in hydrophobic cadavera; but the appearances presented go somewhat farther; they establish likewise a high degree of debility antecedent to death. In most cases the heart points out irregularity in its action, neither systole nor diastole, being synchronous. One ventricle is contracted, the other at the same time dilated: again, one is stuffed with blood, and again dilated and stuffed, if I may so speak, with air only, i. e. dilated without blood. The great arteries and veins in their union with the heart, suffer the same irregular motion.^c Here are evidences of powerful spasmodic action which this muscle undergoes.

We cannot wonder if the distribution of the blood be equally irregular, and the circulation stopped in one part, while this vital fluid is hurried

^b Vid. App. vol. 2.

^c Vid. App. vol. 2. Case of Middlesex Hospital, as one proof. Morgagni and other authors afford more.

ried on with celerity, and accumulated in another, whence, by existing contractions in the course of the vessels, it cannot return to its origin in its usual uniform and uninterrupted way.

To debility therefore may be ascribed all the various phenomena observable both in the living and the dead subject; while the variety in constitution, strength, sex, and age, will influence its degree, and the degree of irregularity in the functions of the individual. To remove the impediment from circulation, and restore the heart to its wonted energy, are *desiderata* of the highest importance. It is not the anxiety alone in the epigastric region, nor oppression at the cartilago ensiformis, a symptom so distressing in every case, which will thereby experience relief; but the state of the brain, the inordinate action and irregularity in the functions of this organ, causing occasional fits of fury, the preternatural sensibility of the optic nerves, the diseased sensibility diffused over the surface, and other distressing symptoms; even Hydrophobia itself, with all the deliria of wild illusion, must equally disappear.

Much remains to be discovered before we arrive at a knowledge of all the phenomena of this malady; but perseverance will accomplish much, and I despair not of the treatment being

as well understood some time hence, as the treatment of the small pox. If no dissections were made till the present century, and if, till lately, mistaken notions of the infectious nature of the complaint in the human species were entertained, it cannot be surprizing, that anatomy has given so little satisfaction. In a few years, I trust, this defect will be supplied, and a better pathology be afforded.

Allusions having been made to another species of Hydrophobia, not arising from rabid infection, yet bearing a strict resemblance to it, a few strictures respecting its nature and distinction follow.

SPONTA.

SPONTANEOUS HYDROPHOBIA,

AS RELATING TO MAN,

BRIEFLY CONSIDERED.

BY this term, I would be understood to mean a disease of a convulsive nature, with a dread of liquids, difficult deglutition, and the symptoms having a very general resemblance to Hydrophobia from rabid infection.

This I would divide into two species; one where a bite from an animal, either mad, or supposed so, preceded; and where terror only seemed to excite the succeeding disease; the other, where strong imagination, or deep impressions of the mind from various other causes induce a train of symptoms apparently similar, and scarcely to be distinguished from the malady excited by rabid infection, unless by a strict and nice investigation.

1st. With respect to terror after a bite; Hydrophobia has always been considered in so dreadful

dreadful a light, that it is impossible to divert the mind from apprehensions where a bite has been received. The certainty of death, and that death also of a violent kind, such as smothering between feather beds, or stifling in some other manner, carries with it a horror sufficient to create the highest alarm. It cannot be surprizing then, to find books filled with histories termed Hydrophobia, but more properly referable to mania, or phrenzy, excited only by fear instead of the disease arising from rabid infection; more especially from the practice of immediately destroying the animal by which they have been bitten; depriving themselves thereby of a knowledge of his real condition, whether mad, or merely enraged; or how far suspicions of their own danger may be well founded.

Terror suddenly excited is powerful almost beyond conception. We read of numerous instances of this kind; and most men's experience, in some part of their lives, affords them examples. It has made the lame, for a short time, forego his crutch; the gouty invalid start from his bed, in spite of pain; and nerved the palsied limb into speedy flight: or on the other hand, has rendered the tongue mute; the body motionless; perverted the judgement, and deprived reason

reason of her empire over the individual sometimes for the remainder of life.^d

Hence it comes to pass, that we see it occasionally excite the very disease dreaded, and draw into every form of irregular action the agitated muscles; forcing the heart into sudden expansion, or contracting its pericardium to firm adhesion round this fountain of life. Hence likewise the lost power in those parts subservient to deglutition, imitative of Hydrophobia. When the body suffers under the higher degrees of this passion, death succeeds; when under a less, health has been restored, or cures *said* to have been performed in convulsive affections, named from this strict resemblance, Hydrophobia.

Arnold

^d Some years ago a common porter, called Pope Badham, resided in Ipswich, of whom I have heard the inhabitants frequently speak, who possessed a power of suddenly exciting terror, irresistible for the moment, to the great annoyance of his neighbours. The effect of this ruthless joke has often been exactly as here expressed: cripples, unable to walk for years, have suddenly started up without their crutches, and fled with agility some paces, at the hideous noise instantly and unexpectedly uttered, in a tone suitable to his purpose, of "take care!"—"run for your lives!" &c. &c. and such cant words. At the same time he ran with violence himself, collecting, as he passed along, a crowd of affrighted followers, whose ghastly and distorted countenances sufficiently bespoke the momentary terror into which they had been betrayed. It was his voice and mode that gave it effect.

Arnold has related one of these, a case of phrenzy.^e Nugent has given another:^f and other authors have related cures of what they termed the same disease. I shall content myself however only with reciting, as examples, a few.

Mrs. Knott^g had the misfortune to receive a bite, which threw her into the deepest apprehensions. She had several attacks of Hydrophobia, and they were always accompanied with severe convulsions, and other symptoms concomitant to the disease. She had sometimes long intervals, but at her best health, and freedom from fits, she felt a horror at the sight of water, and could never touch it without anguish and distress.

The sight likewise of a dog constantly impressed her with terror. Her husband, who was a physician, scarified the part, applied a caustic, and kept the wound open for some time. For *seventeen years* it frequently opened into a running sore, and again healed up. At these times he promoted a discharge, and it seems, that a habit at length was induced; for the sore generally broke out in spring. Here we can obviously

^e Vid. Arnold's case of Hydrophobia, 1793.

^f Nugent on Hydrophobia.

^g Vid. Med. Comment. vol. 6.

ously trace the attack to fear, united with habit. She saw her old sore re-open ; the remembrance of the bite pressed on her mind ; and the doctrine of the possibility of the disease appearing at any distant period, gave birth to what followed.

One of the most noted cures on record is related by Nugent ; the subject Elizabeth Bryant. From a careful perusal however of the case, it is evident, that imagination, and an apprehension of danger, formed the chief symptoms attributed to real Hydrophobia.

From the time her apothecary recommended prophylactics and the cold bath, which was a fortnight after the accident, we find her under considerable agitation of mind. We cannot doubt of her fears being excited by his suggestions. These increased till Hydrophobia, it is said, actually occurred. She trembled at the very sight of a dog ; nor could she touch one without the greatest emotion. It is added, that she was well, and could again swallow, and continued so for some time, till an officious person told her, that though she thought herself cured, she might be sure to die, and cautioned her not to entertain fallacious hopes of security. At this she was greatly moved, and instantly all her symptoms recurred ; nor was it without much care, and a repetition of her former medicines,

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the exhibition of the antispasmodics, that they were removed. A judicious plan of cure was however followed. The disease was to be ranked, as the physician properly conceived, in the spasmodic class: he therefore administered them internally, and applied them externally. He pursued this plan; kept her mind tranquil, and thus succeeded. She was seized indeed on the 32d day after the bite, or about the common time when symptoms of rabid Hydrophobia first appear; but it was not till after being alarmed at the dog's going mad, that was bitten by the same animal that wounded her.

In a case called canine madness, treated successfully by Wrightson,^h the disease appeared earlier than in rabid Hydrophobia. The boy, Michael Gardener, was bitten on the Sunday; on Tuesday the dog was hanged, under all the symptoms of madness. Next day Hydrophobia appeared in the boy. On Friday, when Wrightson first saw him he was tied down to his bed. The symptoms related seem more like phrenzy than Hydrophobia, and from their commencement so early, I do not hesitate in pronouncing them the consequence of fear. Wrightson pursued Nugent's method with success.

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^h Vid. Med. Transf.

In a case related by Mr. Falkener,ⁱ where the disease was also said to be present, Hannah Moore, the patient, felt no inconvenience, till two horses bitten by the same dog died. All the dogs bitten by the mad animal were then hanged. This could not fail to alarm her. The distance from the bite is not mentioned; but a train of symptoms are related, resembling Hydrophobia, and a method of treatment which proved successful was prosecuted.

Another case of this nature happened at Brentwood,^k in 1792, and was under the care of Dr. Shadwell. The patient's name was Cumbers: he became affected on the tenth day after a bite from a dog, which seemed really to be mad; but about this time a neighbouring lad died hydrophobic, named Wyburn, which excited the patient's alarm, and a train of phrenetic symptoms followed, attended with difficult deglutition, all at length happily ending in perfect restoration of health. This was said to have taken place from the use of oil.

We are to keep in view here in pronouncing this a disease from terror, the short distance from the accident at which these symptoms took place,

ⁱ Vid. Med. Transf.

^k Vid. Mem. of the Lond. Med. Soc. vol. 3.

place, the small comparative number of persons bitten, even by rabid animals, who become subject to the malady; and lastly, the recovery, a thing which has never yet been found where rabid infection has supervened.

The case of the clergyman near Manchester, fancying himself already under the disease, and actually having a dread of water, merely from visiting one of his parishioners under the influence of rabid infection, in the last hours of life, is strongly illustrative of what fear and apprehension can produce.

Some cases described by Dr. Gallet Duplessis,¹ evidently refer to this head. One of these arose from dread of a threatened beating. The subject was a common porter, but a man of a delicate habit, and sanguineous temperament. So great was the impression made by these threats, that he fell almost immediately into convulsions, dread of water at the approach of the cup, with total inability to swallow, and other symptoms which accompany Hydrophobia; and after five days died.

The same author describes another instance which he terms Hydrophobia, arising from intoxication.

¹ Vid. Mem. de la Soc. Roy. de Medicine, Paris, ann. 1783, p. 60.

toxication. These maniacal symptoms were accompanied with difficult deglutition, dread of water, &c. They appeared on the third day, and after continuing a very short time the patient died.

He likewise describes a case of tetanic Hydrophobia, from a young man's biting his own finger, under the impression of rage and jealousy.^m The wound was trifling, merely lacerating the skin: next day he was seized with spasms over the body, but especially about the face and throat, preceded by lancinating pains in the bitten part, extending up the arm: to these were added dread of water, sense of suffocation, &c. and he died in a fit the fourth day.

An example is given by Van Swieten,ⁿ of a man, who in a violent fit of anger, gnawed his fore finger, and 24 hours after became hydrophobic, and perished under the severity of its symptoms.

The case of Stanier,^o as related by Mr. Ruffel, is evidently spontaneous, but ought to be named tetanic Hydrophobia; for though bitten
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^m Vid. Mem. de la Soc. Roy. de Medicine, Paris, ann. 1783, p. 59.

ⁿ Vid. Comment. on Boer. Aphor. 1130.

^o Vid. Lond. Med. Journ. vol. 9, p. 256.

in the younger part of his life, neither was the dog rabid, nor the distance less than thirty years. Two or three days before the attack he pared a corn on his left foot, and a pain stretching up this leg immediately preceded the complaint. Is it not probable, that he had injured either a nerve on the toe, or the tendon; and that the origin of the affection lay there? Hence it will be properly referred, with those just related, to tetanus; of which difficult deglutition is frequently the most distinguished symptom.

In the dissection of this patient, accurately made by Mr. J. Hunter, no marks of lesion were observable in the stomach; yet about the cardia, or somewhat up the œsophagus he saw a few dots of extravasated blood: but this differs widely from the lesions in rabid Hydrophobia, described by Dr. Ferriar. If we refer the origin of the disease to the corn, the distance of attack does not exceed three days, agreeing with the general law of tetanus.

2nd. A dread of water, and difficult deglutition, occur where no obvious cause can be assigned. These have been more strictly called *spontaneous*. They may be the consequence of other diseases, such as hysteria, melancholy, mania, &c. In all these instances there is great difficulty in the diagnosis, from the strict resemblance

blance to the rabid Hydrophobia: they often, like it, prove fatal. There is a discharge of saliva, convulsions on the touch of water, timidity, great sensibility to cold air; and even on the inspection of the bodies after death, lesions of the stomach, such as present themselves in the true, have been detected. These may be more strictly referred to tetanus, or at least to the class of nervous affections. Dr. J. Hunter attended one arising from hysteria, which he referred to this head.

Dr. Raymond, of Marseilles, saw a case which proved fatal in two days. The subject was a lad twelve years of age: no bite whatever had been received from any animal. In the height of the paroxysm he was unruly, frantic, endeavoured to bite, and had a dread of water.

A woman of forty, in the fifth day of a fever, under which she laboured, became similarly affected with Hydrophobia, which proved fatal.

Inflammations of the stomach have ended in Hydrophobia. Dr. Innes saw a memorable instance of this in a female patient.^p

Since my residence in this country an instance of spontaneous Hydrophobia occurred. The strictest scrutiny did not discover either a bite

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from a dog, or any familiarity which this patient (a woman) had with this animal for a long time previously, as her physician^q asserted to me. The patient resided near Colchester. She died of the affection. All the symptoms bore the greatest similarity to the disease from rabid virus.

Mr. Thedon, of Berlin,^r has related a case of Hydrophobia, where, without any bite whatever, the patient died. The disease proceeded from cold: convulsions and tetanus followed; and besides Hydrophobia, there was a constant discharge of saliva, with attempts to bite all who approached.

Roux, the ingenious author of a dissertation on this subject, defines the *spontaneous* an “Hydrophobia from an internal cause;”^s and considers it as arising from irritation of various kinds induced on the nerves, especially those of the alimentary canal. Acrid fœces, long retained, may, he thinks, be adequate to this effect. India may produce changes in the fluids, capable of the same; and fatigue, or long and violent exercise in warm weather, may create changes and commotions equally productive of such a complaint. He adduces an example of the latter,
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^q Dr. Stapleton.

^r Vid. Letter to Mr. Hoffman.

^s Vid. Mem. de la Soc. Roy. de Med. ann. 1783.

by citing the case of a boy, who by the fatigue of quick journey in a very warm day, enduring at the same time great thirst, fell soon into all the symptoms of Hydrophobia, and perished in the conflict.

An instance of a similar kind happened to a serjeant at mace, as Boerhaave used to relate. This man performed a journey with rapidity in search of an executioner, to inflict the sentence of the law; and while he was warm, as well as greatly fatigued by exercise, he sat four hours in an open boat, bare headed, exposed to the scorching rays of the sun: nor had he drank any thing that day but inflammable spirits. The consequence was an ardent fever, with Hydrophobia so violent, that he refused all fluids whatever, and died in three days.^t

Another instance of the disease, related by M. Roux, is in consequence of a large quantity of beech nuts eaten by a lad. This hard and insoluble food, irritating the stomach and intestines, proved the cause, and deprived the boy of life.

A third example respects violent agitation of mind. It is the case of a young woman in whom Hydrophobia appeared after violent strug-

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^t Vid. Van Swieten Comment. Boer. Aphor. 1130.

gles to repel the libidinous attempts of a young man against her chastity. This, like the two former cases, proved fatal.

The reason given by this author for an earlier appearance of the symptoms in Spontaneous Hydrophobia after the applied cause, than happens from rabid virus is, that the intestinal canal being thickly spread over with nervous filaments of great sensibility, is irritated by the smallest deviations from the usual stimuli.

Gallet Dupleffis, already quoted, brings forth a memorable example of the power of internal impressions, in giving rise to this disease.^u Here hunger may be considered as a predisposing, and the upbraidings of a cruel and relentless brother against the unfortunate patient, as the exciting cause. After having sustained a severe shock to his feelings from this brutal relative, on account of his poverty; and being compelled at the same time to labour in his service, on nourishment far too scanty for proper support, he took to bed, and in two days became hydrophobic, and phrenetic; was convulsed at the sight of water, and showed an inclination to bite those around him. He continued to the seventh day under this distressing malady, and then died.

These

^u Vid. Mem. de la Soc. Roy. de Medicine, ann. 1783.

These cases are all evidently referable to the conflicts of the mind.

Dr. Bardley's example, so well described, which happened in 1794, is of the same nature.^v The cause was certainly equal to the effect; a situation more poignant to a feeling mind cannot be imagined, than that of poor Lindsay; the cries of hungry children; his ineffectual efforts to provide them bread; the fatigue of near three days and nights of uninterrupted labour; a mind indignant at the unjust treatment of a ruthless parish officer, which he lately experienced; a temperament naturally melancholic, all uniting to induce a commotion in the body, under the form of Hydrophobia, speedily extinguished life.

It might be matter of curious speculation, to enquire into the probable chemical changes, the decompositions and new combinations happening, both to fluids and solids during these conflicts. The formation of a poison in the fluids is within the verge of probability. The waste sustained by labour and inanition; the addition of cold butter-milk to an empty and weakened stomach, as in the last instance, where the gastric juice, and the vessels secreting it, were both perverted; the coats of this organ predisposed to

^v Vid. Mem. of the Manch. Soc. vol. 4, part 2.

ready inflammation, are agents adequate to powerful effects.

Inflammations of the stomach alone are recorded, as producing Hydrophobia: corrosive substances, such as the fulphuric acid,^w have done the same; and internal combinations, even independent of fluids taken by the mouth, might create an inflammation, followed by the same set of symptoms, and by death. This mode of reasoning, merely as a speculation, may be indulged, and serve to account for Spontaneous Hydrophobia; but the reader is left to his own conclusions, or at full liberty to reject such theories, or perfect them into a more consistent system.

Lindsay's body was inspected about 18 hours after death, and the appearances were very far from dissimilar to those where rabid infection had been received. The dissection indeed, as Dr. Bardley regrets, was too slightly made to afford that satisfaction or information which so extraordinary a case might have supplied. We find the minds of those concerned in the operation so deeply impressed with the scene which they had immediately witnessed, and a dread (erroneously
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^w Vid. James on Canine Madness.

entertained) of infection, that they prosecuted this task with great reluctance.

Brain. Not examined.----Thorax. No unusual appearances here, except on the surface of the lungs, which was somewhat darker, and the vessels somewhat more distended with blood than usual.----Fauces. Nothing unusual here.----Larynx and pharynx. No discolouration in their muscles.----Stomach and œsophagus. In the latter, not the least mark of disease: in the former, evident traces of inflammation. This began at the superior orifice, “and was there confined to small and irregular spots, of a dark and red colour; and might also be traced in a linear form, and of a brighter red, along the curvature of the stomach, terminating at the pylorus in large and irregular spots of a gangrenous appearance.”----Contents of the stomach. About three ounces of a dark-coloured fluid, mixed with the medicines taken.----Abdominal viscera. All found.

I have entertained doubts whether Mr. Dundas's patient was a case of rabid Hydrophobia. The distance from the bite to the attack (18 months) but chiefly the situation of mind under which the patient laboured from a fear of imprisonment, led me to a suspicion of its spontaneous nature. Under this idea I class it here. The body was examined between 24 and 30
hours

hours after death, and the appearances were as follow :

Head. Nothing preternatural.----Brain. Vessels not more turgid than usual.----Pharynx. No inflammation, either here or in the neighbouring parts.----Œsophagus and trachea. Covered with a mucus thicker than common. This appearance was attributed to his not having swallowed any fluid for 56 hours.----Left lobe of the lungs appeared inflamed.----Edge of the great lobe of the liver the same.----The remaining viscera natural.

Little can be gathered from this dissection. The stomach is omitted, perhaps the most material part. Had the dissection been earlier, more discoveries might have been made. The increased secretion of mucus in the œsophagus and trachea proves a diseased irritation there. The small inflammations on the lungs and liver seem rather accidental than parts of the present disease.

The favourers of local irritation, and nervous sympathy, will doubtless avail themselves of the great similarity of ventricular abrasions in the cases of Johnston and Lindsay. They will ask, where is the difference, even in those parts which the friends of absorption consider as the surest diagnostic, between the rabid and spontaneous affec-

affections; and how can they prove a specific poison infecting the mass, by having recourse to this pathology, when it is here clearly evinced, that an internal cause can produce the same? To this I can give no better answer, than that there are no proofs to the contrary, sufficient to invalidate the probable supposition, that in spontaneous cases, a poison similar to the canine, be not really *generated*, evolved by a species of irritation, absorbed, and mixed with the mass. Irritation is by some means excited. This process must precede absorption. In the variolous and venereal diseases this is necessary to the farther activity of the virus: but the irritation in consequence of the application of these poisons produces inflammation and pus; while the irritation from rabid virus produces none. Irritation from venereal virus is not always followed by pus, yet absorption is admitted. In what manner are some other specific diseases conveyed to the habit? Are not both scarletina and morbilli produced without pus, and by the application of infection communicated through the absorbents? Is not pertussis produced without pus, without inflammation, and by a peculiar and specific matter applied to the body, exerting also its effects through means of the lymphatics, on the nerves of the bronchiæ, where, I think,

it

it has been deposited, and on which parts alone it is peculiarly adapted for action? This last disease depends on a nervous affection, equally with Hydrophobia. Who will venture to assert, that no absorption of a materies morbi takes place in the production of typhus fever?

Brevel admits the possibility of the production of rabid poison from internal causes; or, as he styles it, "generated from some peculiar *acrimony* in the animal body itself."^x Without being able to prove it by experiments, he presumes this poison to be of a *caustic* nature. In giving his ideas of *causticity*, he is led to consider the effects of pure air, and assumes, as a principle, its great influence, by chemical affinity, on living animal bodies; and he particularly points at the human body. He opposes it to phlogiston,^y which he considers as a body bearing an affinity to pure air; and that on their union, a new substance is produced of properties altogether different from each when separate.

^x De Veneni Animalium rabidorum Naturâ, ejusque Medelâ, Differtatio. 4to, Lipsiæ.

^y Phlogiston, as a body, is now proved to have no existence: yet Brevel's doctrine is not thereby overturned, because by this term other bodies may be understood as entering the composition of animals, with which pure air has an affinity, forming different combinations.

rate. As each attracts the other from the fluids, a great change is produced in them.

If this new production be of a nature insoluble in the fluids, its action is on the part where it was first generated, inducing inflammation there, and producing pus. If it should happen however, under different circumstances, to be of a soluble nature, it is then diffused through the mass, and may remain there a long time without creating any specific effect. The time will be longer or shorter, or proportioned to its solubility. On this foundation he would explain, why the disease appears more readily after any severe agitation of mind, such as fear, anger, &c. for the union which it had with the fluids in general, is destroyed in this act; and the poison being loosened from this bond, exerts its force on the machine. In assuming *causticity* as a principal, he attempts, on the same grounds, to account for the speedier cicatrification of a *rabid*, beyond a simple and unpoisoned wound. Its causticity, or stimulant nature, causing a larger discharge of gluten from the ferous vessels, on which depends the healing process.

A perversion of the gastric juice, one of the most active fluids formed by animal secretion, the stagnation of intestinal feculencies, the process of hastening putrefaction both from the quality

lity of food, from its diminished quantity, or from almost total abstinence for days, are capable of producing extraordinary changes.

Diseases of every kind are induced by changes, deviations from ordinary action ; without them it would be health.

View a person under a fit of inebriety ; observe his irregular conduct ; his deranged ideas, often with irascibility and the other concomitants of this condition. View him when the effects of intoxication have ceased ; he is rational, social, placid, benevolent. How comes this to pass ? A fluid of a particular kind, mixing with the general circulation, gives these changes, is the efficient cause. The brain, as a part of the body, from the changed quality and irregular distribution of the blood within its vessels feels this irregular action : the ordinary train of ideas are deranged, and reason, for a time, by these inordinate stimuli, is suspended. The removal of this by secretion or excretion, or with the addition of rest, and the refreshment of sleep, and afterwards bland food, restore, by a second change, the habit and the order of ideas to their pristine state. View him again under the humid atmosphere of a sunless November ; gloomy, moping, fretful, irritable, discontented with every thing, and even hateful of life. Let him again
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be viewed under the influence of a serene sky, in April or May; chearful and active as the feathered tenantry of the fields over which he passes. Whence arises this difference of condition? It is not, as I think, the contemplation alone of a flowery lawn, and cloudless sky, which elevates, nor the dismal howling of a winter storm that abstractedly depresses him: it is a real change in the component parts of his frame, that accomplishes both.

The atmosphere is the food, the support of life; and on its alterations though imperceptible, depend in a great measure the changes of his habit, modes of thought, and consequent action. These examples taken from common occurrences in life, may in some measure illustrate our argument.^z But poisons are in reality generated in the body. Certain fevers are produced from
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^z It may be objected to this reasoning, that the sight of a beautiful object creates an immediate sensation of pleasure. If this was brought about by a change in corporeal arrangement, its effects could not be so instantaneous. Music, in like manner, soothes the troubled mind, and rapidly changes the order of ideas from melancholy to pleasing and agreeable. Its effects in the cure of some diseases are well ascertained in our times without having recourse to the example of Saul in holy writ, and are also as immediate, which would seem to militate against corporeal change, in these instances, and would refer the whole to the soul alone. But the changes in corporeal order are not less rapid than they are minute, and perhaps not to be exceeded but by thought itself. I can
conceive

this source, and these of the infectious class,^a and capable, like the canine virus, of communicating by contact the same specific disease to others. If certain internal changes generate one kind of infection, one sort of poison, certain other changes, possible under an immense variety, may be fairly allowed to generate another poison equally communicable:

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conceive every new idea producing a corresponding action in the animal machine, and the circulation of blood; the vibrations of the heart and arteries, together with the nervous system, participating equally. It is difficult to explain how the soul and body re-act on each other, but the existence of this re-action is experienced every moment. A new idea may produce a new capacity in the body for absorbing or retaining more or less heat, oxygene, or some of the minuter atoms entering its composition, or it may abstract them in part. In this way the sight of a pleasing landscape, or its opposite, may be partly said to change corporeal order, and affect the involuntary actions of the body. Hopes suddenly elevated into assurances, have speedily changed the cahectic habit, fast sinking into the grave, and laid the foundation of a perfect cure. Vid. Regimental Surgeon. ed. 2. vol. 1. p. 97. Case of Edwards. I have known the removal of a melancholy impression, by a piece of unexpected good fortune, change, in one instance, the morbid secretion of ulcerated cilia (psorophthalmia) which had resisted for months a judicious treatment, and rapidly promoted cicatrification. Judicious physicians apply with promptitude, and address the effects of the passions to the cure of diseases. Changes of the greatest minuteness in living bodies may be productive of great and important alterations, either by inducing a diseased, or promoting a healthy action.

^a Vid. Reflections on Remote Cause in Dogs, vol. 2:

It appears, that the wolf is even more subject to madness than the dog. On the continent, where this animal is more frequent than in our island, the estimate is easily made. The numerous victims of his fury warrant the conclusion. Hunger among these, as among other beasts of prey compelled to gather their precarious food amidst so many enemies, and at the hazard of daily destruction, is much more frequent than with the domesticated tribes fed by the hand of their kind masters. In this half-famished state, the changes abovementioned may speedily and readily take place, inducing that diseased rage, which forces them from their lurking places in the midst of day, to attack whole villages. Probability at least supports this conclusion; and if it be admitted, we must abandon the opinion of infection *alone* being the source of rabies canina, and allow it a double origin as in man, spontaneous, and inoculated.

With respect to the latter, if both the external and the internal species give rise to the same set of symptoms, deviating only by some trifling circumstances in constitution, the poison producing each must have a strict affinity, though generated in different classes, the canine, and the human race. "The identity of effects," as Dr. Bardley says, would indeed, "seem to warrant

the identity of the cause." There is however one evident difference; how far it will affect this mode of reasoning shall be left to others to determine. Man, though he receives it externally, and admitting the possibility of its being produced internally in his own habit, cannot in either way communicate it. It does not appear however that this will create a change in the mode of cure, for the affinity of the poison argues an affinity in the means of removal; and were we fortunate enough to discover a set of remedies capable of allaying the inordinate commotions excited by the inoculated, we should have great reason to conclude, that the same would be successful in the removal of the spontaneous. These remedies have unfortunately baffled the researches of mankind from the earliest records of this complaint.

From the review which has now been taken of the spontaneous and inoculated malady, it will appear not an easy task to draw a diagnostic. If the remedies appropriated to the one, be equally appropriated to the other, this distinction will be less necessary.

I have sometimes thought that a comparison of a sufficient number of cases of both species with each other might afford a distinguishing mark in every instance invariable, but my examinations

minations have not confirmed this altogether satisfactorily.

The case of Lindsay affords little distinction either in the symptoms, or in the appearances on dissection. I find however the maniacal symptoms, especially in cases excited by fear, to be far more violent and of longer duration than from the inoculated; and this, whether the patient recovers, or whether he dies: thus Cumbers was agitated by the highest delirium. He bit off the spout of the tea-pot in which drink was offered to him; he struck his parent who stood in anxious attendance near him. His delirium was so complete, and he was so totally alienated, that after some days when the disease yielded, he had not the smallest recollection of what had passed during his illness, "it presented a perfect blank to his mind."

Others have been so violent, that four, and sometimes six men were not more than sufficient to hold them; others again have been bound down in bed by strong cords, and even then with difficulty held fast. This sometimes occurs to a considerable degree in rabid cases, but the intervals are longer, and the rational faculties, except in the exacerbation, remain unimpaired. The exacerbation is, for the most part, a reiterated series of convulsions, torturing and twist-

ing the body, especially the breast, throat and countenance, without fury and without mania.

I have thought also, that some distinction might be drawn from the salival discharge: this however, though in several, will not in every instance hold good; for in Lindsay we find “an unusual flow of viscid saliva;” yet in other cases, especially those where the disease was conquered, little notice is taken of this discharge; and from thence I conclude it to have been so inconsiderable as not to have attracted attention.

Michael Gardener, as described by Wrightson, had no preternatural discharge, nor is any mentioned in Falkener’s patient, Hannah Moore. The old man, Stanier, spat frequently, but his saliva is said not to have been much in quantity, when at the height of the disease, though viscid; and at a later period it was observed not only to be diminished in quantity, but was more fluid. The same will be found in perusing other cases of the spontaneous kind, which would be tedious as well as superfluous to enumerate here.

Spontaneous cases arising from internal causes, whether from depressing passions of the mind assisted by constitution, or by changes in the habit, occasioned by the quality or scantiness of food, being gradual in their approach, like rabid Hydrophobia, resemble it likewise more intimately in

in their symptoms. This is exemplified not only by Lindsay, but by the poor man whose disease arose from hunger, and the corroding stings that his wounded mind experienced from the barbarous treatment of a brutal brother. It is exemplified likewise in the old man, mentioned by Morgagni, who fell into melancholy and despair, and afterwards into Hydrophobia, from apprehension of a threatened beating.

The rabid case however, though it cannot always be distinguished from the spontaneous, yet will be found constantly accompanied with a copious viscid salival discharge, exciting great part of that distress accumulated by the advancing disease. It is this which so often nearly suffocates the patient; it is this which excites in him the same horror and convulsions as are excited either by the sight or touch of a fluid; it is this which produces the constant hawking, spitting, sudden and convulsive expirations, imitative, at least as figured by a warm imagination, of the stifled barkings of a dog in the act of gnawing a bone, under fear of its being snatched away.

I believe the same in quantity, quality, and mode of excreting the saliva, will not be found in the same ratio of aggravating circumstances in the spontaneous, even from internal causes. I know not what information might be derived

from an experimental investigation of rabid saliva, but the examination merits a trial. Hitherto fear of infection deterred men from sufficient anatomical research; and the saliva, above all fluids, was shunned with the greatest care, dreaded as the certain foundation of infection. Accidental causes however gave birth to doubts on its infectious nature, and observation, often repeated, strengthened them. Some of these will be brought under the reader's review hereafter,^b sufficient, it is hoped, to remove every idea of future injury from handling or making experiments on this fluid.

An ingenious author^c has instituted a number of experiments on healthy saliva. To discover the component parts of the healthy, is a proper preliminary to the discovery of the component parts of this secretion under disease, or the diseased admixtures with which it may be contaminated. His trials however were made on the saliva of the horse, not on the human subject; but the analogy is very near; and as this fluid performs the same offices in the one as in the other

^b Vid. vol. 2. *Hydrophobia in Man, not madness, &c.*

^c M. Hapel, professor in the Veterinary College at Paris. Vid. *Observations et Experiences sur l'Analyse de la Salive du Cheval.*

other species, being in both, nay in every animal, equally subservient to digestion, the difference in composition between them must be so trifling, that little apprehension need be entertained of erroneous conclusions.

His experiments were made with pure saliva, by heat in open and close vessels---with the water bath---by distillation, moist and dry---with distilled water---with syrup of violets, as a test of alkalescence----with spirit of wine----with boiling water---with terra ponderosa, calcined magnesia, and lime, separately triturated with saliva---with fixed caustic alkali---with volatile caustic alkali---with nitric acid---with sulphuric acid---with muric acid---with distilled vinegar---with acid of spar---with a solution of cream of tartar---with acid of sugar---with phosphoric acid---with oil, and with æther.

He next instituted experiments on impure saliva, or saliva mixed with the mucus of the mouth. These were made by distillation in the water bath---on the naked fire---with water simply---it was examined in common air---by quicklime, and with caustic alkali.

He found that saliva, as indeed might easily have been supposed *a priori*, to be very different when proceeding immediately from the gland,

from what it is when mixed with the mucus of the mouth and fauces.

To obtain pure saliva, he laid open, longitudinally in form of an orifice for V. S. the duct leading from the gland,^d whence it poured in abundance; and by making the animal eat, the motion of the jaw assisted the discharge till a sufficiency was collected.

The result of his trials were, that no ammoniacal salt whatever existed in the pure saliva, which after mixture with the mucus of the membranes and glands of the mouth, was constantly present. The pure however had a saline taste, a soapy feel, and was of a greenish yellow colour. Its smell was weak, but peculiar. When proceeding immediately from the gland it is fluid; but if preserved some time the evaporation of its water renders it somewhat thick. It is lighter than distilled water, for it swims on it; nor did it appear from trials under the air pump to contain air. When kept for five days, marks of putridity were perceptible; and at the end of six weeks, it became dried into a black earthy substance. Pure saliva, placed in a small phial in an air pump, filled with *pure* air, did not putrify for *several* weeks; but at length marks of

^d Steno's duct.

of putrefaction were manifest. No acid fermentation preceded the putrefactive process. When it was placed in a water bath it lost its transparency, became flaky, and sunk to the bottom of the vessel. The supernatant liquor was extremely fluid, and showed neither marks of acidity, nor alkalescence. When kept for fourteen days after distillation, it had a smell resembling amber, a smell which has been discovered in the water after distillation of some other animal substances.^e

Pure saliva mixed with distilled water, becomes dissolved in it, losing its taste, colour,
and

^e "From eight ounces of saliva which were employed in this distillation, M. Hapel obtained seven ounces six drams of water; and the matter contained in the retort being collected with care, weighed one dram thirty-seven grains. The loss, thirty-five grains, was attributed to the air which had been disengaged during the distillation. The residuum in this case resembled mucilage in a dried state, and when it was exposed to the air it attracted humidity.

"Having exposed this residuum to the action of a naked fire, in a glass retort, provided with a proper apparatus, he obtained a yellowish-coloured water, highly alkaline, weighing one dram six grains; a yellowish oil to the extent of four grains; six grains of crystallized volatile alkali; six grains of thick empyreumatic oil; six grains of inflammable gas and aerial acid. A charcoal remained in the retort, weighing eight grains, and retaining the shape of the dried saliva before it was submitted to the action of fire. All these weights taken together, amounted to one dram thirty-six grains, the complete weight of the matter employed in this distillation." Vid. Med. Comment. D. 2, vol. 5.

and consistence; but it imparted to syrup of violets a green colour. Spirit of wine precipitated from it a coagulum, which again dissolves in water. Saliva thrown into boiling water is coagulated; but is *not* soluble again in water. Terra ponderosa, calcined magnesia, and lime separately triturated with saliva, disengaged no odour marked with volatile alkali. Fixed caustic alkali produced no smell. Volatile caustic alkali^f was found to augment the fluidity of saliva. Nitric acid rendered it very mucous. Muric acid thickened it, and yellowish filaments were precipitated. Distilled vinegar produced no effect on it. Diluted sulphuric acid poured on it, produced a coagulum, which was precipitated under the form of a thick pellicle; this was of a yellowish brown colour, but by standing the colour became much deeper. When the liquor was filtrated and evaporated, crystals of Glauber's salt remained.^g The acid of spar, united to saliva, rendered it mucous, and produced a brownish precipitate. Solution of cream of tartar altered the consistence of saliva a little, though slowly. The acid of sugar rendered saliva more mucous and produced a slight precipitation. Some thickening followed admixture with the phosphoric acid. All the different acids employed

^f Ammonia pura.

^g Soda vitriolata.

ployed formed, with saliva, different neutral salts; but the fossile alkali^h was the basis of all.

The coagulum obtained by these different combinations with acids were not soluble in water, but were completely soluble in volatile alkali. Saliva is found to dissolve oil.ⁱ Spirit of wine and æther dissolved a small quantity of saliva, but it soon precipitated in form of thick mucilage, which is soluble in water. This proves it to be different from that produced by the action of acids.

From these experiments, as M. Hapel observes, pure saliva appears to be “a mucilaginous watery fluid, formed of a proportion of air, oil, and water, of the fixed mineral alkali of sea salt, and of an insoluble substance, which seems to be of the same nature with the base of the bones.” Sal ammoniac not being a component part of saliva, though the contrary be asserted by different physiologists, when it is found in it, proves it not to be pure.

Saliva mixed with the mucus of the mouth, has a saline taste, and is more viscid than the pure. This may be attributed to the mucus of the mouth, and the loss of some of its water. The tendency it has to form into a froth is explained

^h Soda. ⁱ Useful in taking greasy spots from clothes.

plained by its soapy quality. By agitation through the mouth, and the contact with the atmospheric air, and air from the lungs, it forms in the same manner as soap with water, bubbles containing air. Distillations of saliva from the mouth, both in the water bath and naked fire, give the same products as pure saliva. Quicklime and caustic alkali disengaged from it an odour strongly marked with volatile alkali, distinguishing it peculiarly from pure saliva. This last proves, the author thinks, the sal ammoniac of the saliva contained in the mouth to be a constituent part only of the mucus of the mouth. He could not determine what particular acid was united with the volatile alkali in this ammoniacal salt.^k

These experiments lead to some conclusions, even in the morbid case under review. The thickening of saliva in Hydrophobia being uniform, whether by a vitiated mucous discharge from the membranes and glands of the mouth, or from the stomach itself and œsophagus, is always troublesome. To dissolve and render it more easily ejected, would be a most beneficial service ; and if it be true, as here intimated, that
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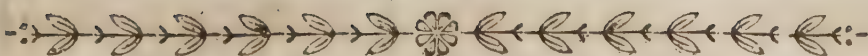
^k In these experiments M. Hapel was assisted by the celebrated Fourcroy.

the caustic volatile alkali is capable of giving fluidity to saliva and mucus of the mouth, inspissated by mixture, an important remedy would appear to be discovered. This has indeed been administered in a few instances of late years, but neither in a dose, nor perhaps in a manner well-adapted, nor by a plan so judiciously preconcerted as to give it full effect, and obtain its highest efficacy. The patient indeed becomes highly affected by the touch of any thing fluid, and this may render it a discouraging circumstance in the administration; but a pilular form might render it more commodiously exhibited, which may be done by mixing it with crumbs of bread. It is at least worthy a trial, that its value may be fairly appreciated, and the result exactly known.

These experiments seem farther useful in pointing out substances which thicken the saliva, rendering it more adhesive and troublesome in the fauces. It would seem to follow, that we should shun them in practice. The nitrous acid seems to be one of these; yet this perhaps is more theoretical than rational; and experience likewise ought to determine respecting the fact. These hints may lead the ingenious into a field of useful investigation. At present I do not feel myself competent to go farther. In what follows

follows therefore I shall confine myself to the examination of a few remedies in more common use in the present times, rejecting the various and accumulated farragos offered by credulity and superstition.

END OF VOL. I.



ANNOTATIONS AND CORRECTIONS

By the Author and some of his Friends.



Page 3. THE assertion made here is surely too strong, considering that this is a manufacturing country, and probably that more than three-fourths of the inhabitants are engaged either in the arts, or in military life.

Dr. MACQUEEN.

This observation which my friend, Dr. M. notices, was chiefly intended to apply to the county wherein I reside, and a few of the adjacent counties, where great care is taken to preserve game. The frequent prosecutions for poaching, and the frequent disputes even among neighbouring gentlemen, occasioned by the pertinacity with which they persevere in keeping from
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molestation this part of their property, appeared sufficient to authorise the reflection. The present war has only lessened poaching for a time ; but it must be some fortunate modification of the game laws which can destroy the practice, and end disputes. Dogs are certainly fewer in number since the tax was imposed. Small as it is, its operation in this part of the country, and within my sphere of knowledge, is already considerable.

The AUTHOR.

Page 7, line 11, 12, 13, corrected thus:---
or a combination of particles may be formed from internal causes, sufficient to constitute infection, and give birth to the disease.

Dr. MACQUEEN.

Page 15, line 16. Would it not be more correct to say, by exacerbation and *remission*, than exacerbation and *interval* ; the latter term implying a perfect *cessation* of the symptoms, the former only an alleviation of them ? Of this the author will best judge.

Dr. MACQUEEN.

It is difficult to determine this point in the dog, with absolute certainty, as we can in the human species. I speak only from the animal's
action

action, which in every part resembles that of ordinary health. In the human species, where the examination can be more intimately made, the disease has only remissions, though these be for a time tolerably complete. A nice observer might, I think, discover some marks of disease in the dog's eye, and something also in his general manner deviating from health. This I have noticed in the history of the dog under consideration, by his convulsive dream, and by his particular motion in running along the pavement. The criticism therefore appears just, and *remission* would have been a more appropriate expression than *interval*.

THE AUTHOR.

Page 21, lines 2, 3, 4, 5, 6, corrected thus:--
 She did not tear the child, as she did the kitten in the morning, but left her on her crying the moment the snap was given. The fury of the bitch did not continue, she being gentle immediately after, suffering the family to fondle her as usual.

DR. GIRDLESTONE.

Page 32, last line---the other, whether the absorbing vessels, by a general law belonging to their nature, after a due time drink up the
 poisonous

poisonous saliva inserted into the wound, and this being carried into the general mass of circulating blood acts on the nerves in a secondary manner and so produces the disorder.

Dr. MACQUEEN,

Page 36, line 10, should run thus:---and consequently he rejects the idea of absorption whereby the mass of fluids are tainted.

Dr. MACQUEEN.

Page 60, last line. There can be no doubt but that the cause of the more violent effects arising from the bite of the viper in summer than in winter is its being more active and vigorous in summer, when a greater quantity of poison is secreted, and consequently instilled into the wound, which will of course be deeper and larger. The same difference is observed by Fontana to take place when the animal is enraged, or not, before the bite be inflicted.

Dr. MACLEAN.

The difference between different men in their experiments on the same subject, and the opposite conclusions drawn by each, create great confusion in science. The inquirer after truth knows not sometimes whom to follow.

Mead

Mead and some friends ventured to taste the poison of the viper, first diluted with water, and then in its pure state. Diluted it gave marks of activity, according to them; and in its pure state still greater. An inflammation was raised in the part to which it was applied.

Redi again had made the same assertion, not as it would appear from his own trials, but on the authority of a viper-catcher, whom he knew. This man boasted that he could swallow it by spoonfuls; and this naturalist adds, that the man has been seen to take it.

Fontana* asserts it to be of a nature resembling oil, or somewhat like the reptile's fat; and harmless when applied to the tongue: this is the result of more than an hundred trials on himself. A sensation of astringency was imparted to the tongue and lips, which did not follow immediately, but came on after some time, and continued for several hours. He found it also harmless when applied to the adnata of different animals, or to the membrane of their internal nares. He concluded this poison to be sweet and agreeable in taste, because dogs devoured it greedily, and licked their lips afterwards, as if pleased. From all which, he infers it to possess
neither

* Vide Experiments on the viper, vol. 1, p. 54, translation.

neither pungency nor causticity, nor does it excite inflammation, nor give pain. His servant Jaques, who was often the object of the same experiment, subscribes fully to his master's opinion. But the bee, the hornet, and the wasp afforded very different conclusions; for when their poison was tasted, the sensation was pungent and extremely painful.

The experiments detailed in the passage to which Dr. Maclean alludes taking them for granted to be accurate, seem to warrant the inference there drawn. The vigour of the viper, as well as of the rattle-snake, is considerably augmented by the heat of the season. The quality of the poison even appears to be different, and the quantity of secretion augmented in a given time. Something of the same kind may likewise take place from the occasional rage of the reptile. The rapidity of the circulating fluids becomes increased from the increased stimulus produced by this passion. The secretion of the poison from these fluids will bear some proportion perhaps to the influx into the secreting organ. This languor and torpor induced by the winter's cold seem a natural consequence of the slower motion of the circulating fluids; it is a well-known law in animal life; it is a law equally cogent in the vegetable kingdom. This checks
the

the secretion of poison, and *modifies* and *moderates* its virulence.

The AUTHOR.

Page 68, line 16. Five instances of this kind occurred to my observation, where no traces of inflammation or chancre could be discovered about the glans penis or urethra.

Dr. MACLEAN.

Page 76, line 5, from bottom. I should be disposed to conclude that the saliva had no share in the production of such effects, but that they arose from irritation, on the same principle that a wound occasioned by a nail, thorn, needle, or the like, is often followed by similar effects.

Dr. MACLEAN.

Page 91, lines 8, 9, 10, corrected thus. Might not hysteria or epilepsy be considered more strongly allied to tetanus than Hydrophobia?

Dr. MACQUEEN

Page 94, line 6 from bottom. I have known it a year and half.

Dr. RODBARD.

Page 104, lines 21, 22, 23, 24, corrected thus. By the loose part of the clothing which
he

he laid hold of, and by timely assistance she received no other injury from him.

Dr. GIRDLESTONE.

Page 109, line 13. A medical friend informs me that a case occurred to him of a sailor, who was seized with tetanus *in the course of the night*, from sleeping on deck in Whampoa, in China, after a hot sultry day. The night was cold.

Dr. MACLEAN.

Page 111, line 7 from bottom. In the cases mentioned in my remarks to you,* it appeared at a more distant period; and you may rely on the accuracy of the dates, as I witnessed the origin and fatal termination of them all.

Dr. MACLEAN.

Page 134, line 14. An experienced inoculator† affirms to me his having observed signs of absorption sometimes so early as the sixth and seventh day. This makes from two to three days between beginning absorption and the commencement of variolous fever. To interrupt the disease excision should not be later than the fifth or sixth day.

The AUTHOR.

Page

* The Author. Vide Appendix, vol. 2.

† Dr. Rodbard.

Page 149, line 5. I would recommend the liquid caustic alkali, or aq. kali pura, or a strong solution of caustic in water, in preference even to the knife.

Dr. MACLEAN.

Page 219, line 11. In the notes taken down after my first visit to Francis Tweed is the following remark: "He had been ordered considerable quantities of vinegar before I saw him; but instead of producing any good effect, it seemed to increase the sickness and vomiting with which he was affected in a most violent degree. Besides considerable quantities of viscidropy saliva, a yellow bilious matter was likewise vomited." The violent spasmodic and convulsive affections commenced much earlier, and the disease terminated sooner than in the case of Jeremiah Groves.

Dr. MACLEAN.

I have refrained from making any remarks on the doctrine, though I have been tempted to it on one or two points, especially that of absorption, which I suspect is pushed too far at the expence of the nervous system, in some parts of your analogical reasoning.

Dr. MACQUEEN.

As I am in search of truth, and embrace that opinion only which appears to me to approach nearest to it, I must allow the same right of private judgement, not only to my friend who gives the above hint, but to others. Candour requires me to lend a patient ear to arguments against this doctrine. I desert an opinion the moment that it is proved to be erroneous. De Haen, and others used many ingenious arguments against the inoculation of the small pox. In spite of their ingenuity the practice prevails and benefits mankind. The doctrine of the circulation of the blood too was opposed; and absorption itself, as carried on by a separate system of vessels appropriated to, that end met with no little opposition.

The lacteals were even deprived of their province of conveying nutrition, and the body was said to receive it through the medium of the nerves. It has been contended also by a modern physiologist, that the extremities or endings of nerves were the beginnings of the muscular fibre.* The nervous system is certainly of the highest importance in the animal œconomy; this is so apparent as to strike the most common observer, or the most unlettered peasant. Hence
perhaps

* Vide Cullen's Physiology.

perhaps it comes to pass, that more offices have from time to time been bestowed on this system, than maturer observation sanctions, or experiment approves.

If the opinion be ill founded which respects absorption in Hydrophobia, no argument, howsoever ingenious or laboured, will long prevent it from sinking into neglect. If the disease be really produced by local irritation, and by sympathy of nerves, observations will multiply, and facts will be discovered, which will place this doctrine on a foundation beyond the strongest opposition to overturn. Discussion at present may benefit the public, while a better explanation of the *modus operandi*, and a more certain and speedy method of cure may be the happy consequence. If this end be obtained I shall feel little concerned at the overthrow, or refutation of my opinion.

The AUTHOR.



